Athena System Manual

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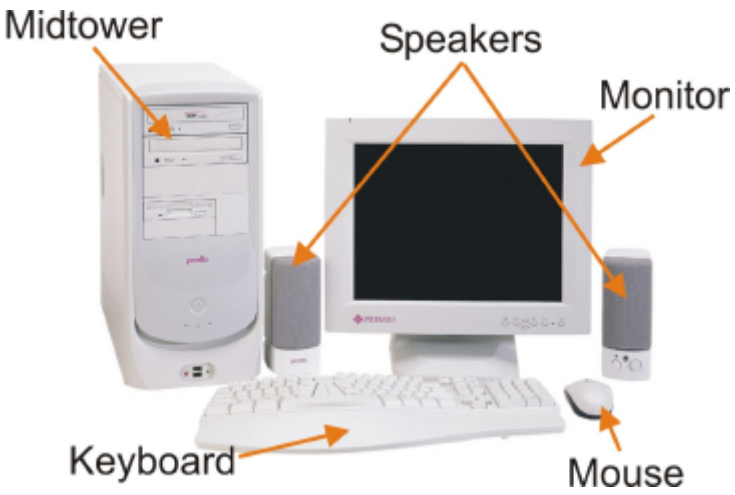
Getting Started

Your PREMIO® Athena system typically consists of five main components:

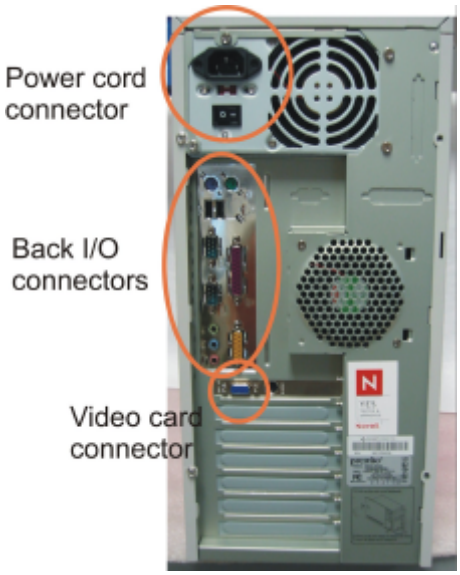
- Midtower
- Monitor
- Speakers
- Keyboard
- Mouse



Depending on which components you've ordered with your Athena system, the components shown in the picture above may vary.

Setting Up

To set up your Athena system, simply connect your monitor, mouse, keyboard, and speakers to the rear of the midtower.



1. Connect the female end of the power cord to the chassis power cord connector, and then connect the male end of the power cord to your wall outlet or power strip
2. Connect the keyboard, mouse, speakers (if any) to the back I/O connectors (see next page for details)
3. Connect your monitor to the video card connector

Connecting Your Keyboard, Mouse, and Speakers

The picture below is an enlarged view of the back I/O connectors.

The keyboard, mouse, and speakers connectors are color coded for your reference. Simply connect your keyboard to the purple keyboard connector, and your mouse to the green mouse connector.

Next, connect your speakers to the light-green connector; this is assuming you are using the **onboard audio**. If you have an add-on audio card, please consult the manual for the location of the speakers connector.

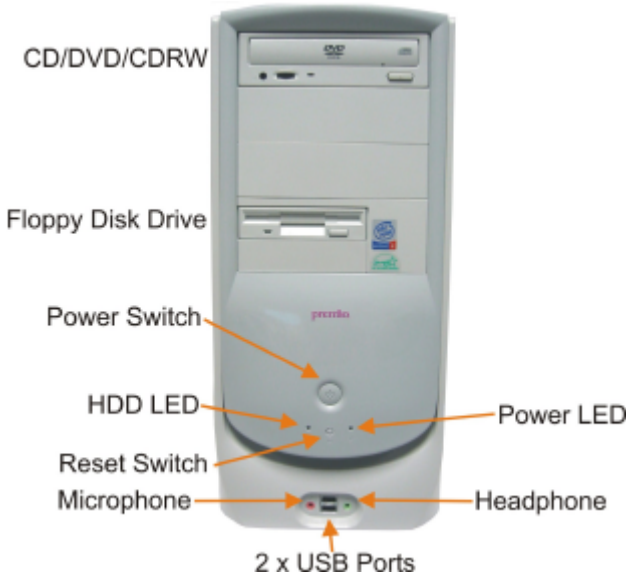
Connecting Your Monitor

The next step is to connect your monitor to your video card. See picture below for the location of the video card connector.

Once everything is connected, you can now turn on your monitor and system. See the next page for the location of the midtower's power switch.

Switches and Indicators

The system unit's front panel provides access to the CD-ROM, DVD-ROM, or CD-RW and floppy drives, and to the system's switches and indicator LEDs.



- The **CD/DVD/CDRW drive** reads information on CDs or DVDs
- The **floppy disk drive** reads and writes data to 3.5" 1.44MB floppy disks
- The **power switch** turns the system on and off
- The **hard disk drive (HDD) LED** lights when the HDD is in use
- The **power LED** lights when the system is on
- The **reset switch** restarts the system in the event of a hardware lockup
- The **microphone connector** allows you to connect a microphone for audio input
- The **headphone connector** allows you to connect a standard headphone
- The **USB ports** allows you to connect USB devices such as printers, digital cameras, scanners, etc.

Upgrading

You can upgrade your PREMIO system with:

- Expansion cards
- Additional system memory
- Additional hard disk drive

To install an upgrade, you must open the system unit. Before proceeding, read the important cautionary note below. Then follow the steps on the next page.

Caution! *Static discharge can cause permanent damage to internal electronic components of your computer. Always use the following precautions when working inside the system unit:*

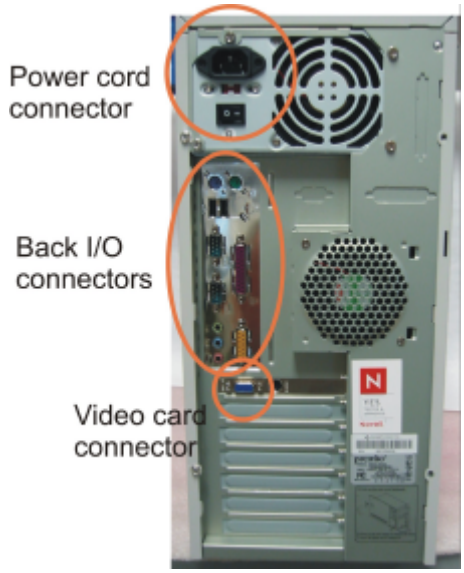
- **Avoid working in an area with carpeted floor**
- **Touch the back of the midtower's power supply first**
- **Wear a grounding wrist strap (available at most electronics stores) when handling electronic components**
- **Do not remove a component from its antistatic packaging until you are ready to install it**

Opening the System Unit

Note *Opening the system unit could affect your warranty. Check with the dealer where you purchased your system before opening the system unit.*

To open the system unit, you will need a standard philips (the cross head, not the flat head) screwdriver:

Turn off the system and unplug the power cord from the power cord connector (see picture below):



Next, using the screwdriver, remove the two screws as shown in the picture below.

Once the two screws are removed, you can simply slide the side cover off by pulling it towards you.

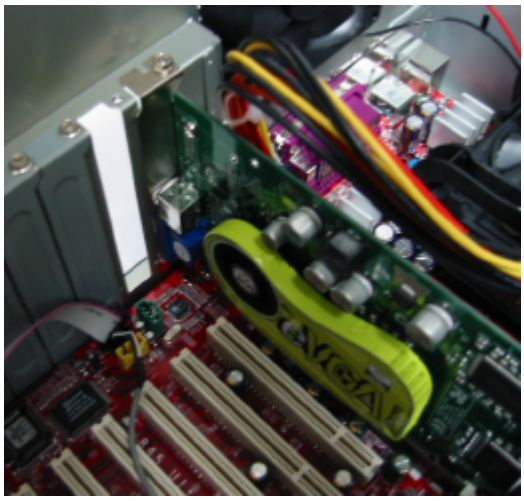
Closing the System Unit

To close the unit, slide the side panel back on and reinstall the two screws.

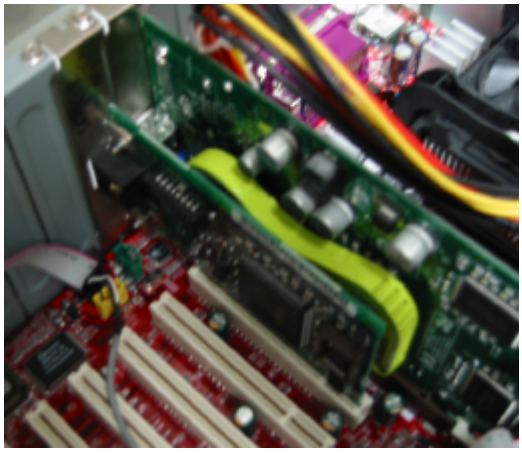
Installing an Expansion Card

To install an expansion card, open the system unit as described on the previous page.

Next, remove the screw securing the slot bracket cover for the expansion slot you want to use. Then remove the slot bracket and install your expansion card. Save the screw to secure the expansion card later. You should also keep the slot bracket, in case you wish to remove the expansion card later in then future.



Insert the expansion card firmly into the slot, making sure it is seated completely. Then install the screw onto the expansion card.



Installing Additional Memory

For details on memory configuration, including the placement and type of memory to use in your system, please refer to the motherboard user's manual that came with your system.

Installing an Additional Hard Disk Drive

To install an additional hard disk drive in your system, follow these steps:

Disconnect the hard drive cable and power connector.
Remove the two screws securing the drive bay.
Slide the bay toward the rear of the system unit to remove it.
Insert the new drive into an open position in the bay and secure it with four screws.
Slide the bay back into the system unit and secure it with two screws.
Connect the cables.

Getting Help

Troubleshooting

Your PREMIO system is designed to provide years of trouble-free performance. If you have a problem with your system, first check the information in this section for a quick solution.

Monitor Does Not Work

If your monitor appears not to be working properly:

Check that the monitor's power cable is securely attached to the monitor and to an outlet that is receiving power.
Check that the monitor's video cable is securely attached to the monitor and to the system unit's video card connector.
Check that the monitor's power switch is on.
Adjust the monitor's brightness and contrast controls.
If possible, substitute another monitor that is in good working order. If the substitute works, your monitor may need repair or replacement.

Keyboard Does Not Work

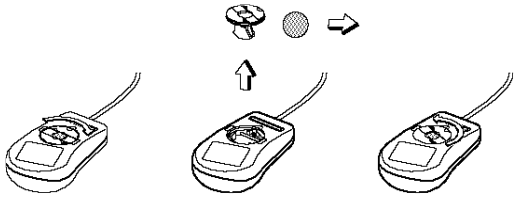
If the NumLock indicator in the upper right corner of the keyboard does not light when the system powers up, or the keyboard does not work:
Check that the keyboard cable is securely attached to the system unit's keyboard connector.
If possible, substitute another keyboard that is in good working order. If the substitute works, your keyboard may need replacement.

Mouse Does Not Work

If your mouse pointer does not move or moves erratically when you move the mouse:

Check that the mouse cable is securely attached to the mouse connector on the system unit.

Disassemble the mouse and clean the roller ball. (This does not apply if you have an optical mouse.)



System Unit Problems

The fan inside the system unit should make a low, steady sound when operating properly. If the fan is totally silent:

- Check that the system power cord is securely attached to the back of the system unit and to a power outlet. Verify that the outlet has power.
- If possible, substitute another power cord that is in good working order. If the substitute works, replace your power cord.
- If the fan makes excessive noise:
- Turn off the system, open the system unit case, and inspect the fan for any obstructions.
- Turn on the system and listen closely to the fan. If the noise comes from inside the fan housing, your power supply may need replacement.

Hard Disk Problems

Your hard disk should make a slight whirring sound when operating properly. If the disk is totally silent:

- Turn off the system, open the system unit case, and check that the power cable between the power supply and the hard disk is securely attached at both ends. If it is, your hard disk may be defective.
- If the hard disk makes excessive noise:
- Turn off the system, open the system unit case, and remove the hard disk power cable connector from the hard disk. Then turn the system back on. If the noise disappears, your hard disk may be defective.

Warranty Service

If you have a problem with your PREMIO system that requires service during the warranty period, contact the dealer where you purchased your system. Your dealer will try to resolve the problem for you. If your dealer cannot resolve the problem, you can contact PREMIO directly at the address below.

Note *To obtain warranty service, you must provide proof of purchase, including the purchase date.*

Technical Support

You can contact PREMIO technical support at the following address:

Premio Computer, Inc.
918 Radecki Court
City of Industry, CA 91748

Telephone: 800-568-6388
Fax: 626-839-3191
Email: support@premiopc.com

PREMIO on the Internet

PREMIO maintains a web page on the Internet with the latest information on PREMIO products, updated drivers, answers to common problems, an extensive component troubleshooting guide, and more. Visit our web page at:

http://www.premiopc.com

Appendix

Limited 3-Year Warranty

Premio Computer, Inc. warrants its line of PREMIO® computer systems (hereinafter "Product") to be free from defects in material and workmanship for a period of three (3) years from the date of original purchase from Premio Computer, Inc. or a Premio Computer, Inc. authorized reseller. This warranty does not cover monitor and LCD panels, nor third-party hardware and software which has a separate manufacturer's warranty. Warranty for such third-party hardware and software, if any, is subject to the third-party's warranty policy.

PREMIO branded monitors are warranted as follows:
Three (3) year parts and labor except for CRT
One (1) year parts and labor for CRT

PREMIO branded LCD panels are warranted as follows:
One (1) year parts and labor

SERVICE UNDER WARRANTY

If this Product fails to be in good working order during this 3-year warranty period (or specific period of time as noted above), Premio Computer, Inc. will, at its option, repair or replace the Product. Repair parts and/or replacement Products may be either new or reconditioned at Premio Computer Inc.'s discretion. The limited warranty does not include service to repair damage from improper installation, abuse or modifications to the Product not approved in writing by Premio Computer, Inc. Any service repair outside the scope of this limited warranty shall be at Premio Computer, Inc.'s or its Authorized Service Provider's rates and terms in effect.

This warranty is valid only within the United States and applies only to Products which are new and in cartons which are unopened on the date of purchase.

EXCLUSIONS FROM PREMIO, INC. LIMITED WARRANTY PROGRAM

ALL OTHER EXPRESSED AND IMPLIED WARRANTIES FOR THIS PRODUCT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED. IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER AS WARRANTED ABOVE, PREMIO COMPUTER, INC.'S SOLE AND EXCLUSIVE REMEDY SHALL BE REPAIR OR REPLACEMENT AS STATED ABOVE.

IN NO EVENT WILL PREMIO COMPUTER, INC. BE LIABLE TO THE CUSTOMER OR ANY THIRD PARTY FOR ANY DAMEAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT. THIS LIMITATION APPLIES TO DAMAGES OF ANY KIND INCLUDING ANY DIRECT OR INDIRECT DAMAGES, LOST PROFITS, LOST SAVINGS OR OTHER SPECIAL, INCIDENTAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES WETHER ARISING OUT OF THE USE OF OR INABILITY TO USE SUCH PRODUCT, EVEN IF PREMIO COMPUTER, INC. OR AN AUTHORIZED PREMIO COMPUTER, INC. REPRESENTATIVE OR DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR OF ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR SOME PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. PREMIO COMPUTER, INC. AUTHORIZED RESELLERS AND SERVICE PROVIDERS/PARTNERS MAY BE CHANGED, ADDED OR DELETED, WITHOUT NOTICE OR LIABILITY. PREMIO COMPUTER, INC. DISCLAIMS ANY AUTHORIZED RESELLERS AND SERVICE PROVIDER/PARTNER TO THE PROGRAM. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

FCC Standards

The FCC (Federal Communications Commission) restricts the amount of radiation and radio frequency emissions from computing equipment.

This equipment generates and uses radio frequency energy and if not installed and used properly in strict accordance with the operation instructions, reference manuals, and the service manual, may cause interference to radio or television reception.

This equipment can be tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC rules. There limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, then the user is encouraged to try to correct the interference by one or more of the following procedures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Important Safety Instructions

These instructions are provided by Underwriters Laboratories, Inc.

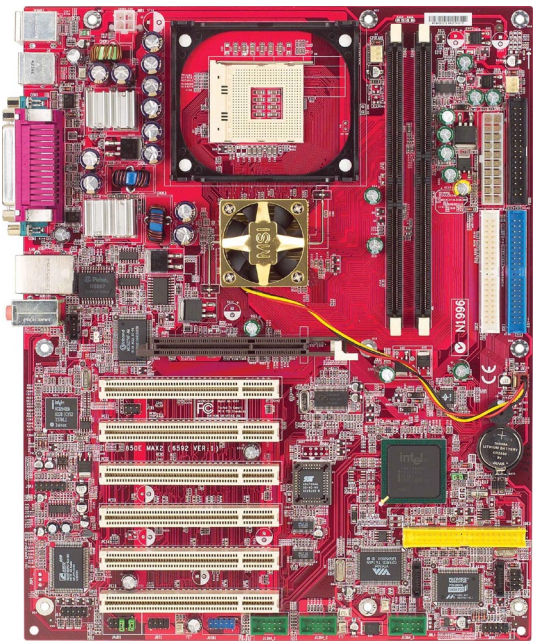
1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand or table. The product may fall, causing serious damage to the product.
6. Slots and openings on the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
9. Do not allow anything to rest on the power cord. Do not locate this product where the cord will be walked on.
10. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. Except as explained elsewhere in this manual, don't attempt to service this product yourself. Opening and removing those covers that are marked “Do Not Remove” may expose you to dangerous

voltage points or other risks. Refer all servicing on those compartments to service personnel.

13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    A. When the power cord or plug is damaged or frayed.
    B. If liquid has been spilled into the product.
    C. If the product has been exposed to rain or water.
    D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
    E. If the product has been dropped or the cabinet has been damaged.
    F. If the product exhibits a distinct change in performance, indicating a need for service.

850E Max2

MS-6592 (v1.X) ATX Mainboard



Version 1.0
G52-M6592X1

Manual Rev: 1.0
Release Date: Nov. 2002

CE N1996

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MS-6592

FC **Tested to comply with FCC Standard**

For Home or Office Use

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Award® is a registered trademark of Phoenix Technologies Ltd.
AMI® is a registered trademark of American Megatrends Inc.

Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.x with Intel 850E and ICH4 chipsets	Nov. 2002

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: **http://www.msi.com.tw/**
- Contact our technical staff at: **support@msi.com.tw**

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged.
    - The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

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Getting Started

Thank you for purchasing the 850E Max2 (MS-6592 v1.X) ATX mainboard. The 850E Max2 is based on Intel® 850E North Bridge & ICH4 South Bridge chipsets for optimal system efficiency. Designed to fit the advanced Intel® Pentium 4 processors, 850E Max2 delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- ➤ Support Intel Pentium® 4 processor in the 478 pin package
- ➤ Support up to 3.06GHz or faster
- ➤ Support Hyper Threading Technology

Chipset

- ➤ Intel® 850E chipset
  - Support Direct RDRAM up to 2GB maximum memory
  - Support System bus at 100/133MHz (400/533MHz Data Bus)
- ➤ Intel® ICH4 chipset
  - AC97 controller integrated
  - 2 full IDE channels, up to ATA100
  - Low pin count interface for SIO
  - USB 2.0 controller

Main Memory

- ➤ Support two 232-pin 32-bit gold-lead RIMM sockets up to 2GB
- ➤ Support RIMM 3200 (800MHz) ECC/ 4200 (1066MHz) non-ECC RAMBUS memory

Slots

- ➤ One AGP (Accelerated Graphics Port) slot
- ➤ Six 32-bit/33MHz Master PCI bus slots

On-Board IDE

- ➤ An IDE controller on the ICH4 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA100 operation modes
- ➤ Can connect up to four IDE devices

On-Board Peripherals

- ➤ On-Board Peripherals include:
  - 1 floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
  - 2 serial ports (COM A + COM B)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 6 USB 2.0 ports (Rear * 4/ Front * 2)
  - 1 D-Bracket 2 pin header

- 3 audio ports in vertical

Serial ATA Interface (Optional)

➤ Support PROMISE 20376 controller chip with two serial ATA (150MB/s) and one ATA133
➤ Support RAID 0 or 1 by up to 2 or 3 parallel ATA or serial ATA connectors

Audio

➤ Support C-Media CMI8738/PCI-6ch audio
➤ 6CH DAC for AC3® 5.1CH purpose
➤ HRTF-based 3D positional audio, supporting DirectSound™ 3D and A3D™ interface
➤ Support 4.1/5.1 speakers, C3DX positional audio in 4/6CH speaker mode
➤ Legacy audio SBPRO™ compatible
➤ DLS-based wavetable music synthesizer

Network (Optional)

➤ Support Intel 82540EM Gigabit LAN or 82562EZ 10/100 LAN

IEEE1394 (Optional)

➤ Support 3 ports (via external bracket) with transfer rate up to 400 Mbps

BIOS

➤ The mainboard BIOS provides "Plug & Play" BIOS which detects the peripheral devices and expansion cards of the board automatically.
➤ IDE drive auto configure, Advanced Power Management (APM) 1.2, ACPI 1.0, DMI 2.0, ECC/Parity support, LS120 support, audo enables onboard SCSI termintor

Dimension

➤ ATX Form Factor: 30.5 cm (L) x 24.4 cm (W) x 4 layers PCB

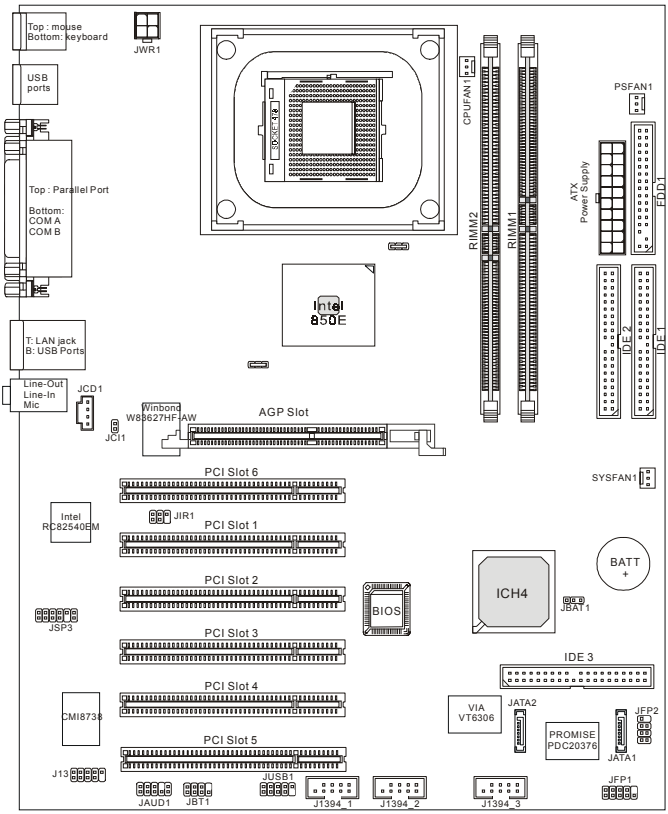
Mounting

➤ 9 mounting holes

Others

➤ Suspend to RAM/Disk (S3/S4)
➤ PC2001 compliant

Mainboard Layout



850E Max2 (MS-6592 v1.X) ATX Mainboard

MSI Special Features

Fuzzy Logic™4

The *Fuzzy Logic™ 4* utility is a user friendly tool that allows users to view and adjust the current system status. To overclock the CPU FSB (Front Side Bus) frequency under the Windows operating system, click ***FSB*** and use the right and left arrow keys to select the desired FSB, and then click ***Apply*** to apply the new setup value. To enable the system running at the specified FSB every time when you click ***Turbo***, click ***Save*** to save the desired FSB first. If you want to know the maximal CPU overclocking value, click ***Auto*** to start testing. The CPU FSB will automatically increase the testing value until the PC reboots. After rebooting, click ***Turbo*** to apply the test result. Click ***Default*** to restore the default values.

Features:

- ✦ MSI Logo — links to the MSI Web site
- ✦ CPU Speed — allows users to adjust the CPU speed through CPU Multiplier and FSB
- ✦ Voltage — allows user to adjust the voltage of CPU/Memory/AGP
- ✦ MSI Info — provides information about the mainboard, BIOS and OS
- ✦ CPU Info — provides detailed information about the CPU
- ✦ CPU Fan Speed — shows the current running speed of CPU Fan
- ✦ CPU Temp. — shows the current CPU temperature

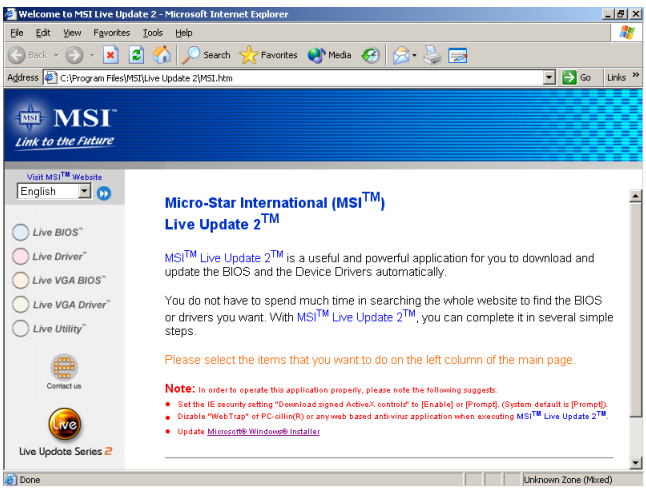
MSI Reminds You...

*To adjust the options under **CPU Speed** and **Voltage**, use the right and left arrow keys to select the desired value and then click **Apply** to run the setup value.*

Live BIOS™/Live Driver™

The Live BIOS™/Live Driver™ is a tool used to detect and update your BIOS/drivers online so that you don't need to search for the correct BIOS/driver version throughout the Web site. To use the function, you need to install the "MSI Live Update 2" application. After the installation, the "MSI Live Update 2" icon (as shown on the right) will appear on the screen.

Double click the "MSI Live Update 2" icon, and the following screen will appear:


Welcome to MSI Live Update 2 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address C:\Program Files\MSI\Live Update 2\MSI.htm
MSI
Link to the Future
Visit MSI™ Website
English
Live BIOS™
Live Driver™
Live VGA BIOS™
Live VGA Driver™
Live Utility™
Contact us
Live Update Series 2
Micro-Star International (MSI™)
Live Update 2™
MSI™ Live Update 2™ is a useful and powerful application for you to download and update the BIOS and the Device Drivers automatically.
You do not have to spend much time in searching the whole website to find the BIOS or drivers you want. With MSI™ Live Update 2™, you can complete it in several simple steps.
Please select the items that you want to do on the left column of the main page.
Note: In order to operate this application properly, please note the following suggests.
Set the IE security setting "Download signed ActiveX controls" to [Enable] or [Prompt]. (System default is [Prompt]).
Disable "WebTrap" of PC-cillin(R) or any web based anti-virus application when executing MSI™ Live Update 2™.
Update Microsoft® Windows® Installer
Done
Unknown Zone (Mixed)

Five buttons are placed on the leftmost pane of the screen. Click the desired button to start the update process.

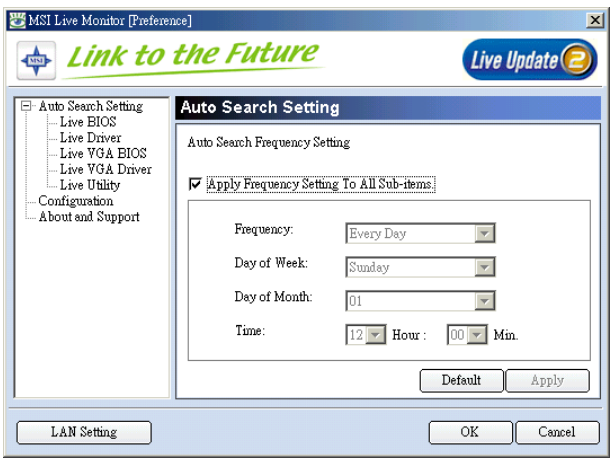
- **Live BIOS** – Updates the BIOS online.
- **Live Driver** – Updates the drivers online.
- **Live VGA BIOS** – Updates the VGA BIOS online.
- **Live VGA Driver** – Updates the VGA driver online.
- **Live Utility** – Updates the utilities online.

If the product you purchased does not support any of the functions listed above, a "sorry" message is displayed. For more information on the update instructions, insert the companion CD and refer to the "Live Update Guide" under the "Manual" Tab.

Live Monitor™

The Live Monitor™ is a tool used to schedule the search for the latest BIOS/drivers version on the MSI Web site. To use the function, you need to install the "MSI Live Update 2" application. After the installation, the "MSI Live Monitor" icon (as shown on the right) will appear on the screen. Double click this icon to run the application.

Double click the "MSI Live Monitor" icon at the lower-right corner of the taskbar, and the following dialog box will appear. You can specify how often the system will automatically search for the BIOS/drivers version, or change the LAN settings right from the dialog box.



You can right-click the MSI Live Monitor icon to perform the functions listed below:

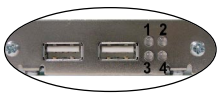
- **Auto Search** – Searches for the BIOS/drivers version you need immediately.
- **View Last Result** – Allows you to view the last search result if there is any.
- **Preference** – Configures the Search function, including the Search schedule.
- **Exit** – Exits the Live Monitor™ application.
- **FAQ** – Provides a link to a database which contents various possible questions about MSI's products for users to inquire.

D-Bracket™ 2 (Optional)

D-Bracket™ 2 is a USB bracket integrating four Diagnostic LEDs, which use graphic signal display to help users understand their system. The LEDs provide up to 16 combinations of signals to debug the system. The 4 LEDs can detect all problems that fail the system, such as VGA, RAM or other failures. This special feature is very useful for overclocking users. These users can use the feature to detect if there are any problems or failures. D-Bracket™ 2 supports both USB 1.1 & 2.0 spec.

D-Bracket™ 2 for mainboard with bluetooth connector (1 port)

D-Bracket™ 2 for mainboard without bluetooth connector (2 ports)



D-Bracket™ 2	Description
	System Power ON - The D-LED will hang here if the processor is damaged or not installed properly.
	Early Chipset Initialization
	Memory Detection Test - Testing onboard memory size. The D-LED will hang if the memory module is damaged or not installed properly.
	Decompressing BIOS image to RAM for fast booting.
	Initializing Keyboard Controller.
	Testing VGA BIOS - This will start writing VGA sign-on message to the screen.

● **Red** ○ **Green**

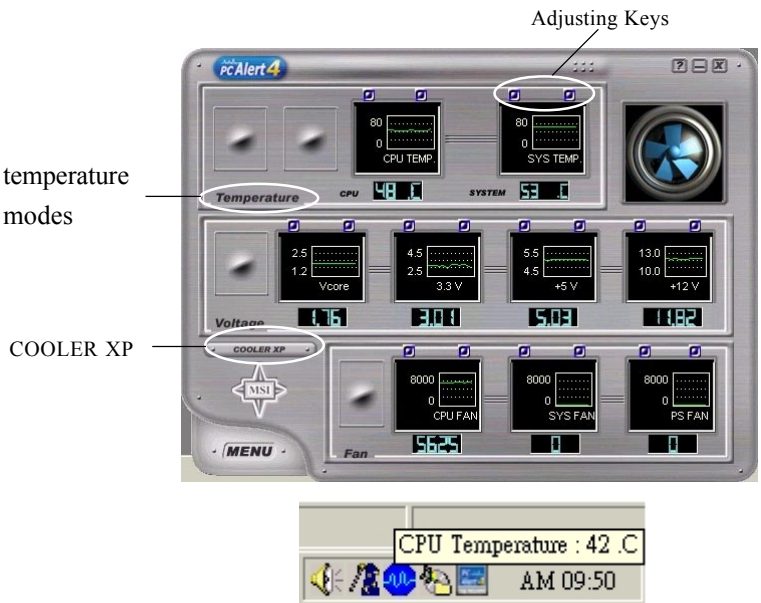
D-Bracket™ 2	Description
	Processor Initialization - This will show information regarding the processor (like brand name, system bus, etc…)
	Testing RTC (Real Time Clock)
	Initializing Video Interface - This will start detecting CPU clock, checking type of video onboard. Then, detect and initialize the video adapter.
	BIOS Sign On - This will start showing information about logo, processor brand name, etc….
	Testing Base and Extended Memory - Testing base memory from 240K to 640K and extended memory above 1MB using various patterns.
	Assign Resources to all ISA.
	Initializing Hard Drive Controller - This will initialize IDE drive and controller.
	Initializing Floppy Drive Controller - This will initializing Floppy Drive and controller.
	Boot Attempt - This will set low stack and boot via INT 19h.
	Operating System Booting

PC Alert™ 4

The PC Alert™ 4 is a utility you can find in the CD-ROM disk. The utility is just like your PC doctor that can detect the following PC hardware status during real time operation:

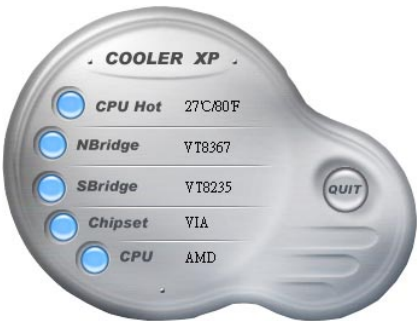
- ✦ monitor CPU & system temperatures
- ✦ monitor fan speeds
- ✦ monitor system voltages

If one of the items above is abnormal, the program main screen will be immediately shown on the screen, with the abnormal item highlighted in red. This will continue to be shown until the condition returns to the normal status.



Users can use the Adjusting Keys to change the minimum and maximum threshold of each item for the system to send out a warning message. Click *Temperature* to select the temperature modes of either Fahrenheit (℉) or Celsius (℃). The PC Alert4 icon on the Status Area will show the current CPU temperature.

To better protect the CPU from overheating, a new feature, **COOLER XP**, has been added to decrease the temperature of AMD Athlon XP CPU. To do so, simply click **COOLER XP** and the screen will show the **Cute** skin (as shown below) with information about the CPU and chipset. Right-click the mouse to select the skin you want to switch to.



Cute

MSI Reminds You...
*The new feature **COOLER XP** will work only if your mainboard supports AMD Athlon XP CPU.*
Items shown on PC Alert 4 vary depending on your system's status.

MSI DVD 5.1 Channel (Optional)

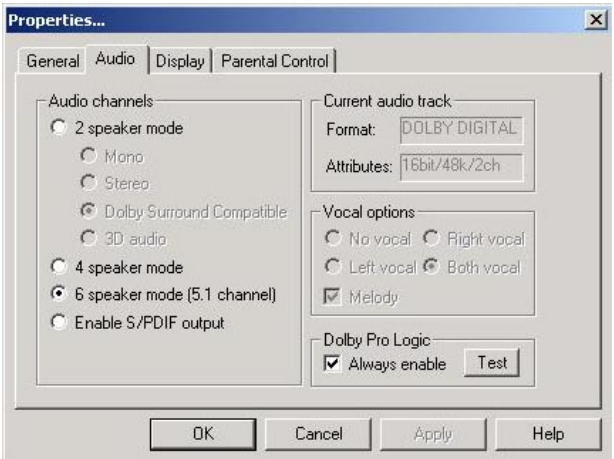
The motherboard comes with MSI DVD application which supports 5.1 channel (6-channel audio) operation. The accompanying MSI DVD is a convenient tool to meet increasing demands for home entertainment.

Note: *MSI DVD supports Dolby Digital format only. To view DTS-formatted video, you should convert it to Dolby Digital format first.*

To play DVD with 6-channel audio output, you must configure both the MSI DVD application and the audio codec's software utility. Otherwise, the 6-channel audio function will not work properly. For information on how to select 6-channel mode in the audio software utility, refer to *Appendix. Using 4- or 6-Channel Audio Function*.

Follow the procedures below to enable 6-channel support with MSI DVD:

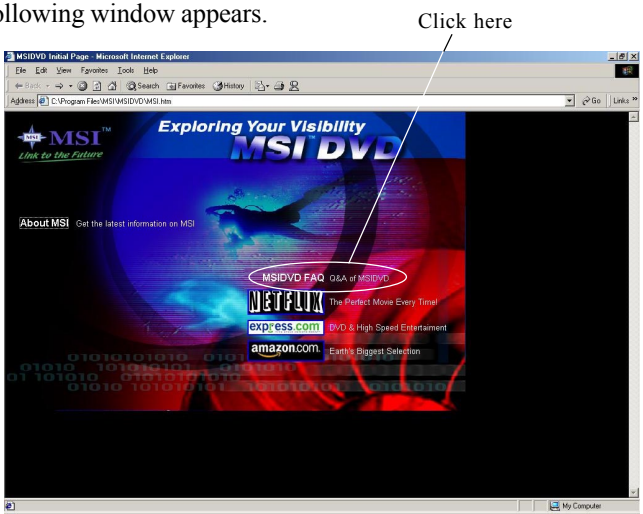
1. Click on this button from the control panel of MSI DVD.
2. Click the **Audio** tab.
3. Select **6 speaker mode (5.1 channel)**.



4. Click **OK**.

For more information about MSI DVD, you can refer to the online help coming with the application.
To enter the online help:

1. Click on the icon at the bottom-right corner of the control panel.
2. The following window appears.



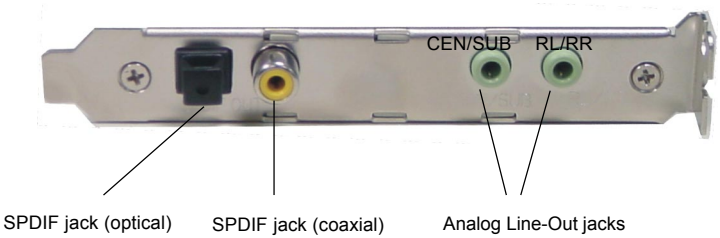
3. Click **MSIDVD FAQ**.

S-Bracket (Optional)

S-Bracket is a bracket which provides 2 SPDIF jacks for digital audio transmission and 2 analog Line-Out connectors for additional 4-channel analog audio output. With the S-Bracket, your system will be able to perform 6-channel audio operation for wonderful surround sound effect, or connect to Sony & Philips Digital Interface (SPDIF) speakers for audio transmission with better quality.

The S-Bracket offers two types of SPDIF connectors: one for optical fiber and the other for coaxial connection. Select the appropriate one to meet your own need. For more information on S-Bracket, refer to *Appendix. Using 4- or 6-Channel Audio Function*.

S-Bracket

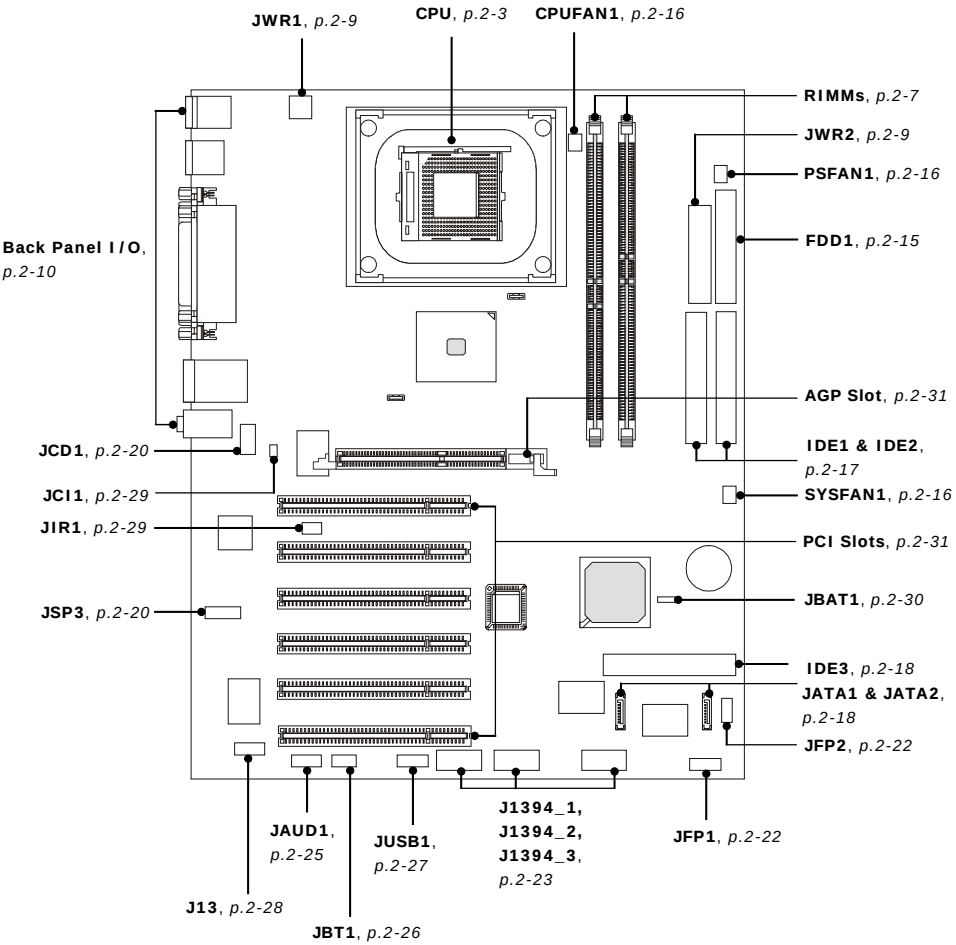


Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Core Speed Derivation Procedure

CPU Clock multiplied by **Core/Bus ratio** equals the CPU core speed.

For example:

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4 GHz

MSI Reminds You...

Overheating

Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.

Replacing the CPU

While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

CPU Installation Procedures for Socket 478

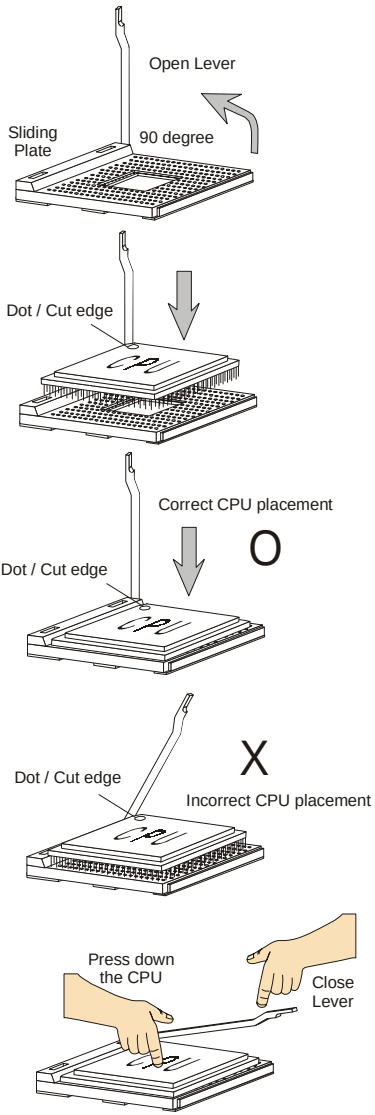
1. Please turn off the power and unplug the power cord before installing the CPU.

2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.

3. Look for the cut edge. The cut edge should point towards the lever pivot. The CPU can only fit in the correct orientation.

4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.

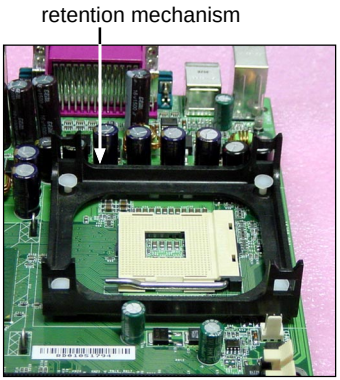
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



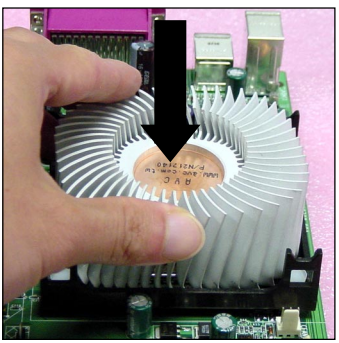
Installing the CPU Fan

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

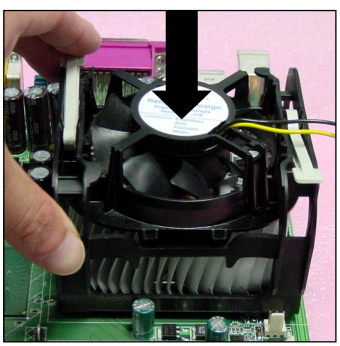
1. Locate the CPU and its retention mechanism on the motherboard.



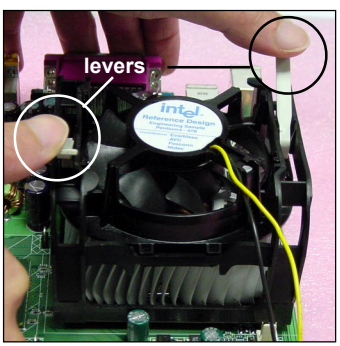
2. Position the heatsink onto the retention mechanism.



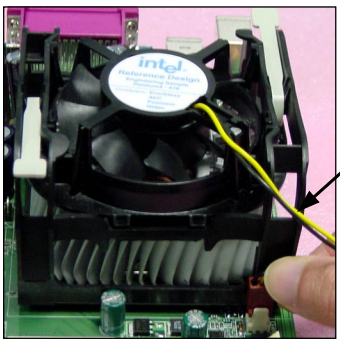
3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.



4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.



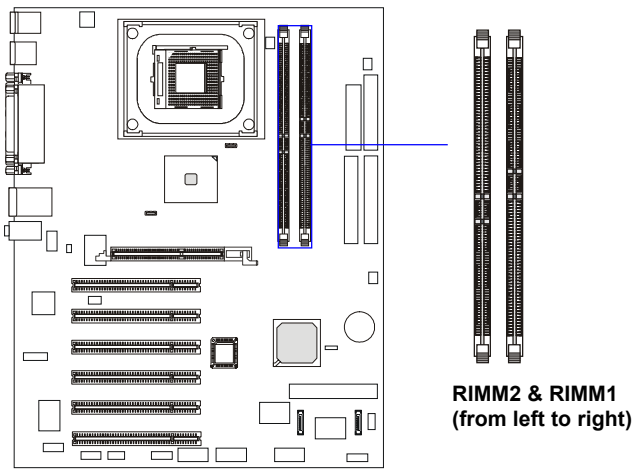
5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.



NOTES

Memory

The mainboard provides 2 gold-lead sockets for 232-pin RIMM modules. To operate properly, modules must be installed in pairs. You can install either one RIMM and one C-RIMM or two RIMMs. If only one RIMM slot is populated, you must install one C-RIMM (Continuity RIMM) module on the other unused RIMM slot. A C-RIMM module is a dummy module for continuing the signal connection. The mainboard supports the memory size up to 2 GB.



RIMM2 & RIMM1
(from left to right)

Introduction to RIMM Modules

RIMM module is a module integrated with RDRAM chips. It is similar to a DIMM package but uses different pin settings. Rambus trademarked the term RIMM as an entire word for a module using Rambus technology.

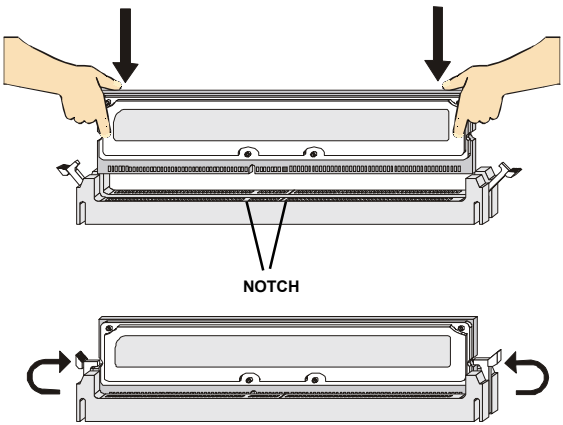
RIMM Modules Combination

You can install the RIMM modules in the following combination:

Slot	RIMM1	RIMM2	Total Memory
Option 1	128MB, 256MB 512MB, 1GB	C-RIMM (0MB)	128MB~1GB
Option 2	128MB, 256MB 512MB, 1GB	128MB, 256MB 512MB, 1GB	256MB~2GB

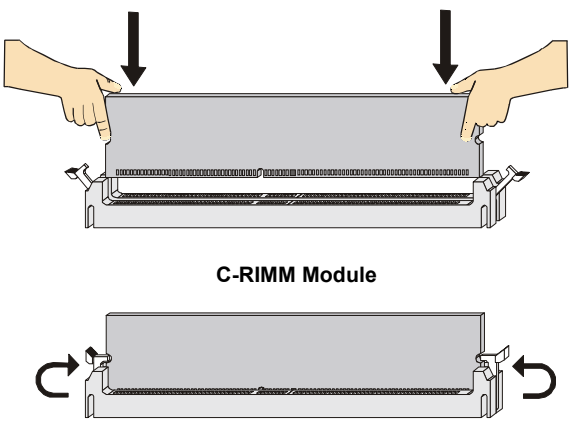
Installing RIMM and C-RIMM Modules

1. The RIMM slot has 2 Notch Keys, so the RIMM memory module can only fit in one orientation.
2. Insert the RIMM memory module vertically into the RIMM slot. Then push it in.
3. The plastic clips at sides of the RIMM slot will automatically close.



RIMM Module

4. You may insert another RIMM module or a C-RIMM module (as shown below) in the unused slot to ensure the system's proper operation.



C-RIMM Module

Power Supply

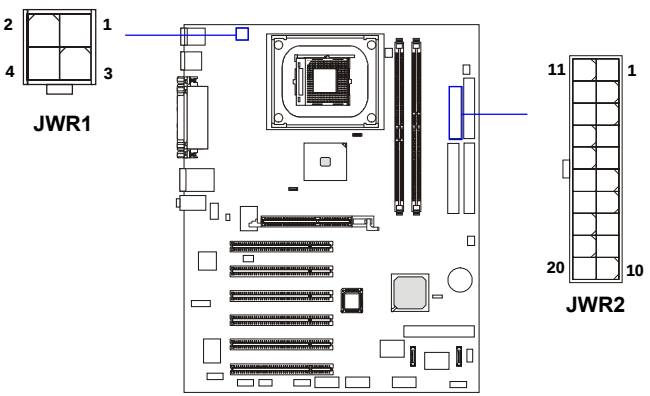
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: JWR2

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JWR1

This 12V power connector is used to provide power to the CPU.



JWR1 Pin Definition

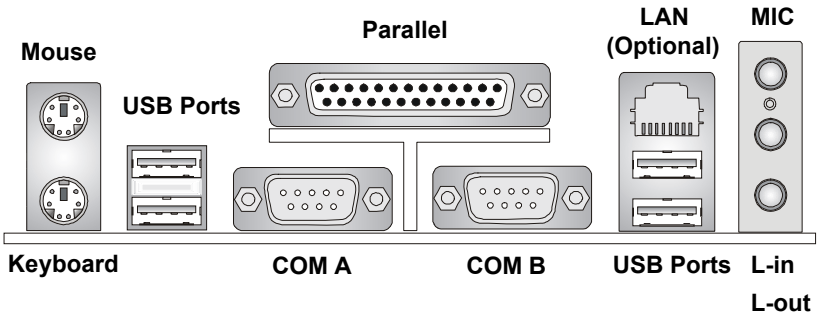
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

JWR2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

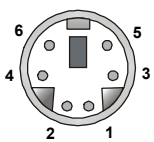
Back Panel

The back panel provides the following connectors:



Mouse Connector

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:



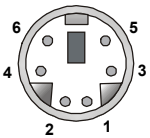
PS/2 Mouse (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

Keyboard Connector

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.



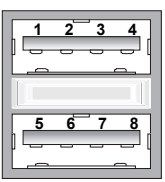
PS/2 Keyboard (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

USB 2.0 Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.



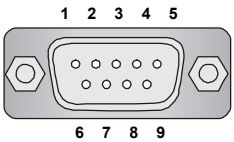
USB Ports

USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

Serial Port Connectors: COM A & COM B

The mainboard offers two 9-pin male DIN connectors as serial port COM A & COM B. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connectors.



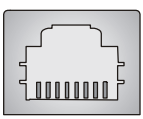
9-Pin Male DIN Connector

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

RJ-45 LAN Jack (Optional)

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



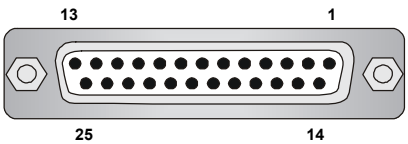
RJ-45 LAN Jack

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector as LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



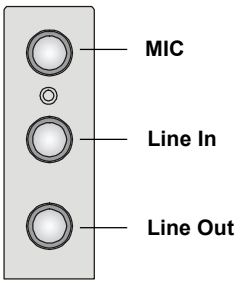
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Audio Port Connectors

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

1/8" Stereo Audio Connectors



MSI Reminds You...

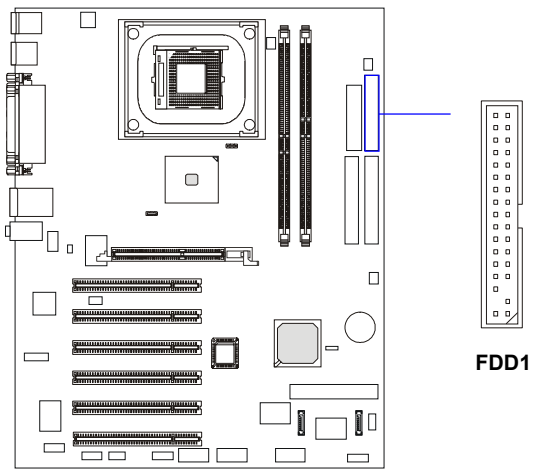
*For advanced audio application, CMedia 8738MX is provided to offer support for **6-channel audio operation** and can turn rear audio connectors from 2-channel to 4-/6-channel audio. For more information on **6-channel audio operation**, please refer to Appendix. Using 4- or 6-Channel Audio Function.*

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, modem, LAN, USB Ports, IR module and CPU/System/Power Supply FAN.

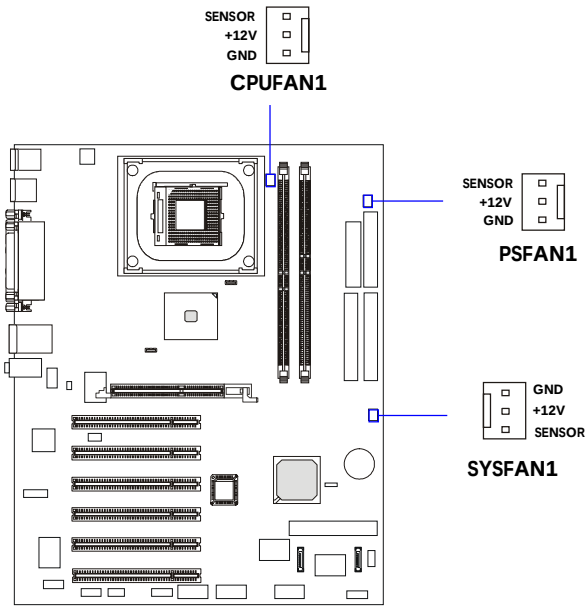
Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Fan Power Connectors: CPUFAN1/SYSFAN1/PSFAN1

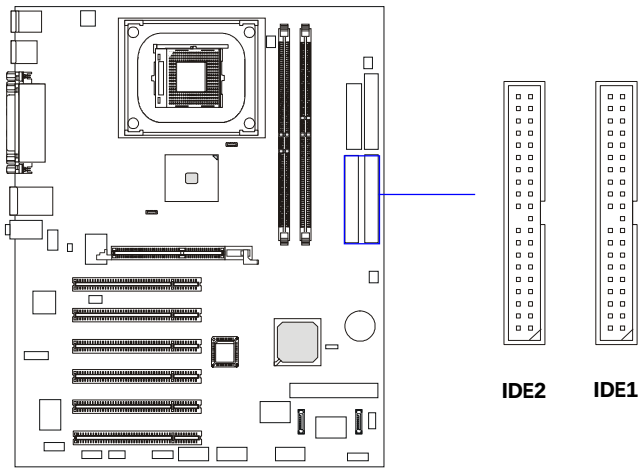
The CPUFAN1 (processor fan), SYSFAN1 (system fan) and PSFAN1 (power fan) support system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



MSI Reminds You...
Always consult the vendors for proper CPU cooling fan.

Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

MSI Reminds You...

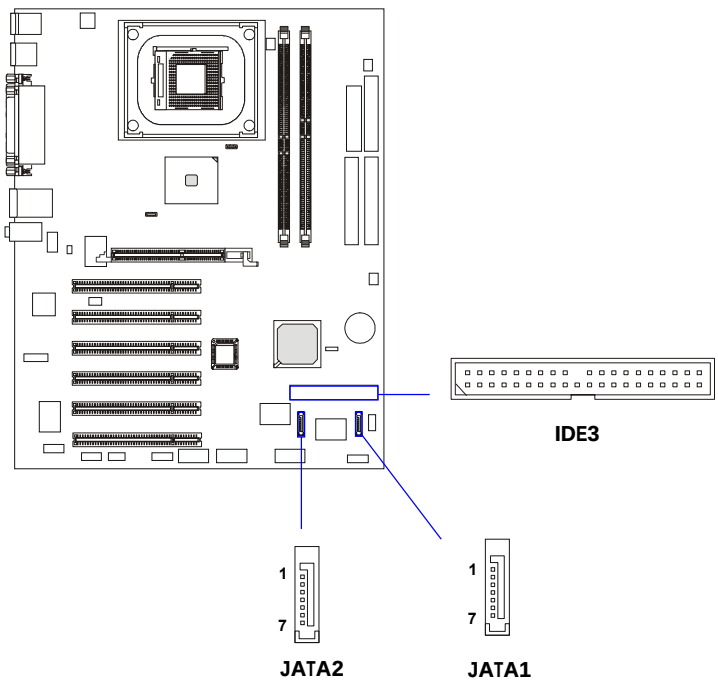
If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

Hard Disk RAID Connectors: IDE3, JATA1 & JATA2

The mainboard has 3 IDE RAID connectors, which are controlled by Promise 20376.

IDE3 is a 32-bit Enhanced PCI IDE and Ultra DMA 66/100/133 controller that provides PIO mode 0~5, Bus Master, and Ultra DMA 66/100/133 function. You can connect up to 2 hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.

The mainboard also provides two optional dual high-speed Serial ATA interface ports, JATA1 & JATA2. Each supports 1st generation serial ATA data rates of 150 MB/s. Both connectors are fully compliant with Serial ATA 1.0 specifications. Each Serial ATA connector can connect to 1 hard disk device. Please refer to *Serial ATA Raid* manual for detail software installation procedure.

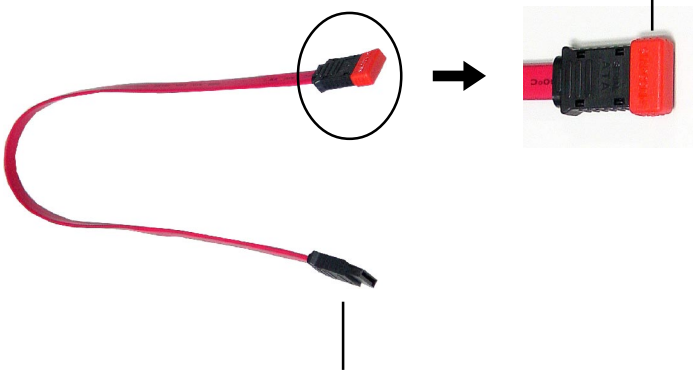


JATA1 & JATA2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	TXP
3	TXN	4	GND
5	RXN	6	RXP
7	GND		

Optional Serial ATA cable

Take out the dust cover and connect to the hard disk devices



Connect to JATA1 or JATA2

MSI Reminds You...

Please do not fold the serial ATA cable in a 90-degree angle, which will cause the loss of data during the transmission.

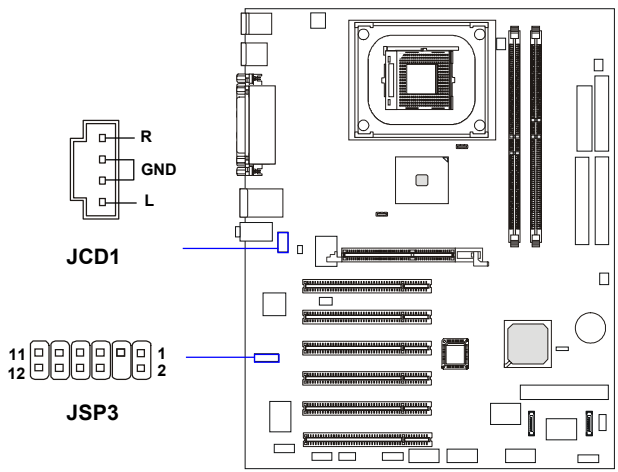
CD-In Connector: JCD1

The connector is for CD-ROM audio connector.

S-Bracket (SPDIF) Connector: JSP3 (Optional)

The connector allows you to connect a S-Bracket for Sony & Philips Digital Interface (SPDIF). The S-Bracket offers 2 SPDIF jacks for digital audio transmission (one for optical fiber connection and the other for coaxial), and 2 analog Line-Out jacks for 4-channel audio output.

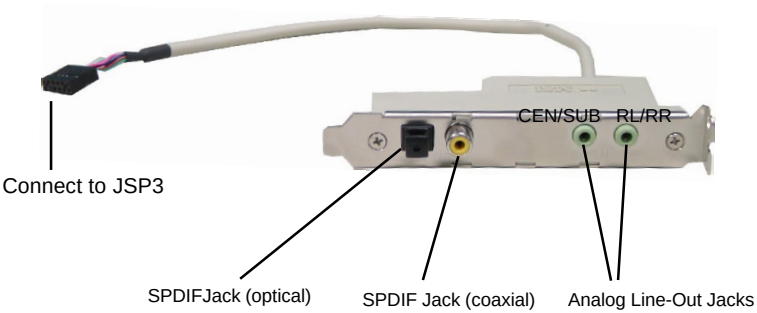
To attach the fiber-optic cable to optical SPDIF jack, you need to remove the plug from the jack first. The two SPDIF jacks support *SPDIF output* only.



JSP3 Pin Definition

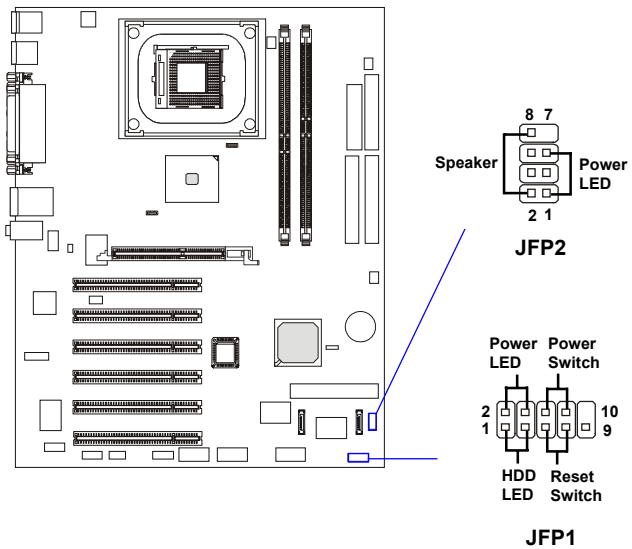
PIN	SIGNAL	DESCRIPTION	PIN	SIGNAL	DESCRIPTION
1	VCC5	VCC 5V	2	VDD3	VDD 3.3V
3	SPDFO	S/PDIF output	4	(No Pin)	Key
5	GND	Ground	6	SPDFI	S/PDIF input
7	LFE-OUT	Audio bass output	8	SOUT-R	Audio right surrounding output
9	CET-OUT	Audio center output	10	SOUT-L	Audio left surrounding output
11	GND	Ground	12	GND	Ground

Optional S-Bracket



Front Panel Connectors: JFP1 & JFP2

The mainboard provides two front panel connectors for electrical connection to the front panel switches and LEDs. JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JFP1 Pin Definition

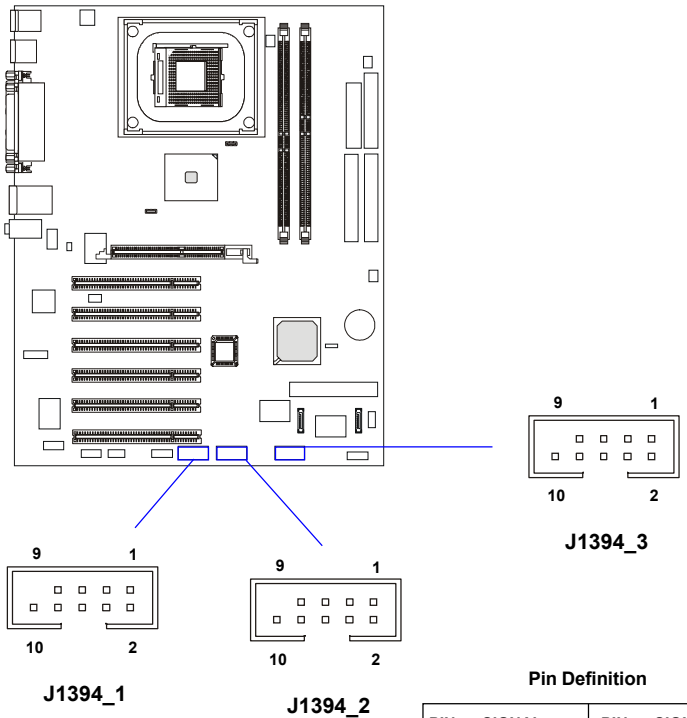
PIN	SIGNAL	DESCRIPTION
1	HD_LED_P	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED_N	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW_N	Reset Switch low reference pull-down to GND
6	PWR_SW_P	Power Switch high reference pull-up
7	RST_SW_P	Reset Switch high reference pull-up
8	PWR_SW_N	Power Switch low reference pull-down to GND
9	RSVD_DNU	Reserved. Do not use.

JFP2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	GND	2	SPK-
3	SLED	4	BUZ+
5	PLED	6	BUZ-
7	NC	8	SPK+

IEEE 1394 Connectors: J1394_1, J1394_2, J1394_3 (Optional)

The mainboard provides three 1394 pin headers that allow you to connect optional IEEE 1394 ports.



Pin Definition

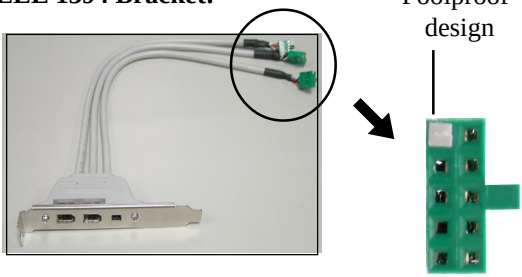
PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

MSI Reminds You...

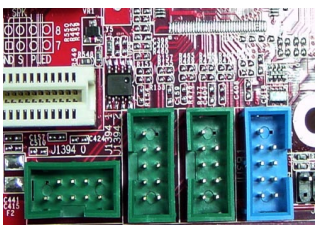
Please note that the following installation procedures are for your reference only. The actual layout of the IEEE1394 connectors may look slight different from the pictures shown below.

How to attach the IEEE 1394 Bracket:

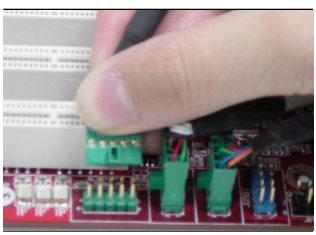
1. Take out the IEEE 1394 Bracket.



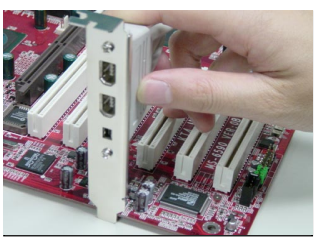
2. Locate the IEEE1394 connectors (J1394_1, J1394_2 & J1394_3) on the mainboard.



3. Connect the cables of the IEEE 1394 Bracket to the connectors. Align the foolproof design with the connectors to avoid mis-inserting.

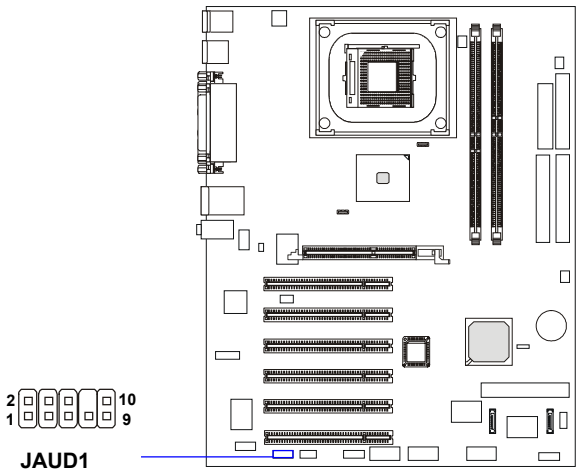


4. Place the IEEE 1394 Bracket into the first slot of your system case.



Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect to the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

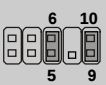


JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	AUD_MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	AUD_MIC_BIAS	Microphone power
4	AUD_VCC	Filtered +5V used by analog audio circuits
5	AUD_FPOUT_R	Right channel audio signal to front panel
6	AUD_RET_R	Right channel audio signal return from front panel
7	HP_ON	Reserved for future use to control headphone amplifier
8	KEY	No pin
9	AUD_FPOUT_L	Left channel audio signal to front panel
10	AUD_RET_L	Left channel audio signal return from front panel

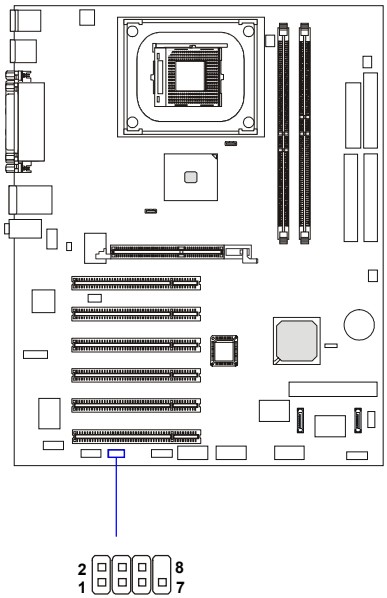
MSI Reminds You...

If you don't want to connect to the front audio header, pins 5 & 6, 9 & 10 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



Bluetooth Connector: JBT1 (Optional)

This connector is used to connect a bluetooth module for wireless connection.



JBT1

JBT1 Pin Definition

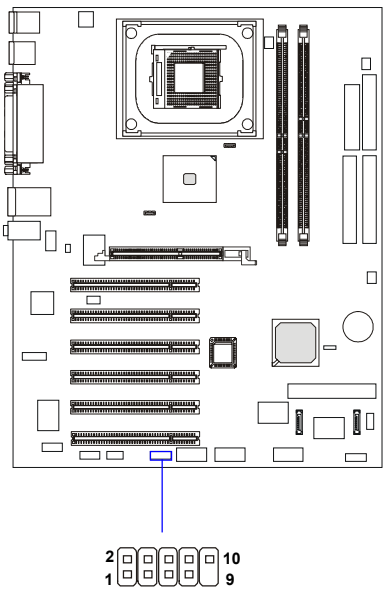
PIN	SIGNAL	PIN	SIGNAL
1	5VDUAL	2	3VDUAL
3	D+ (USB signal)	4	GND
5	D- (USB signal)	6	GND
7	GND	8	NC

MSI Reminds You...

Because the bluetooth connector shares the USB interface with blue-colored USB2.0 connector, one of the USB2.0 port (see instruction on the cable) will not function when you attach a bluetooth module to this connector.

Front USB Connectors: JUSB1

The mainboard provides one USB 2.0 pin headers *JUSB1* that is compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.



JUSB1
(USB 2.0/Intel spec)

JUSB1 Pin Definition

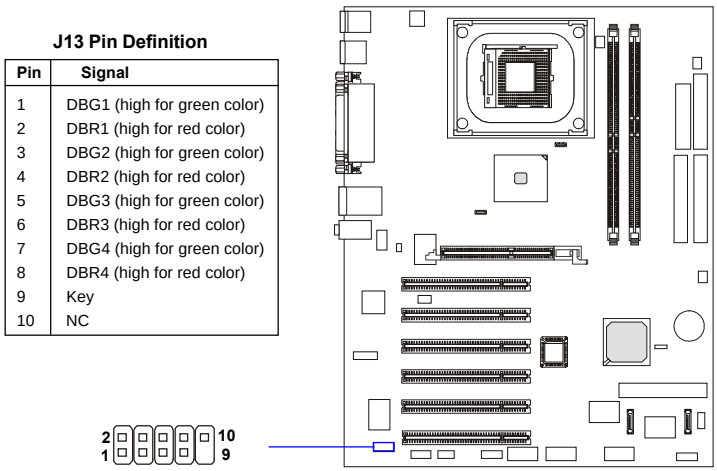
PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	USBOC

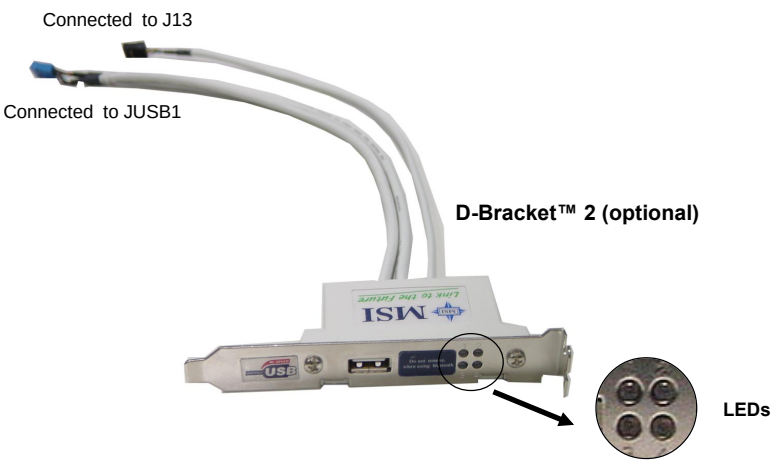
D-Bracket™ 2 Connector: J13 (Optional)

The mainboard comes with a J13 connector for you to connect to D-Bracket™ 2. D-Bracket™ 2 is a USB Bracket that supports both USB1.1 & 2. 0 spec. It integrates four LEDs and allows users to identify system problem through 16 various combinations of LED signals. For definitions of 16 signal combinations, please refer to *D-Bracket™ 2* in *Chapter 1*.

J13 Pin Definition

Pin	Signal
1	DBG1 (high for green color)
2	DBR1 (high for red color)
3	DBG2 (high for green color)
4	DBR2 (high for red color)
5	DBG3 (high for green color)
6	DBR3 (high for red color)
7	DBG4 (high for green color)
8	DBR4 (high for red color)
9	Key
10	NC



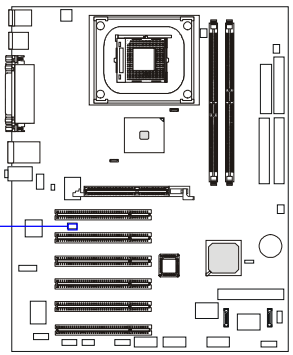


IrDA Infrared Module Header: JIR1

The connector allows you to connect to IrDA Infrared module. You must configure the setting through the BIOS setup to use the IR function. JIR1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

Pin	Signal
1	NC
2	NC
3	VCC5
4	GND
5	IRTX
6	IRRX

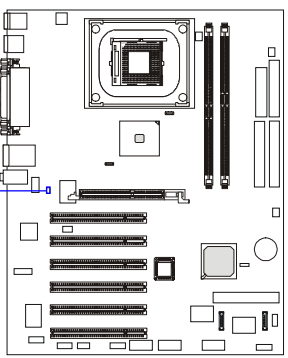
JIR1



Chassis Intrusion Switch Connector: JCI1

This connector is connected to a 2-pin chassis switch. If the chassis is opened, the switch will be short connected. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record. JCI1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JCI1

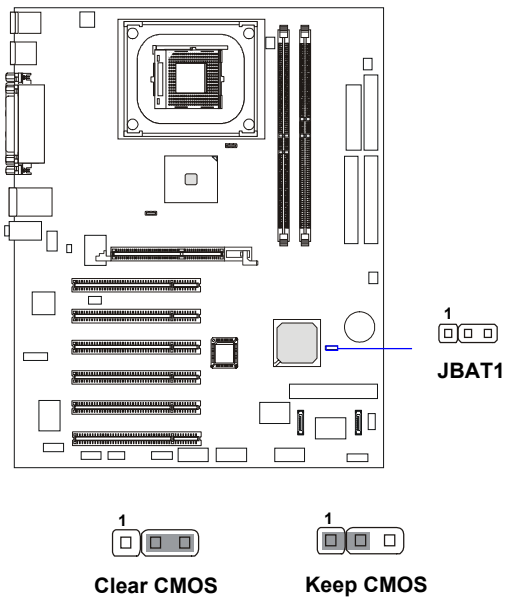


Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

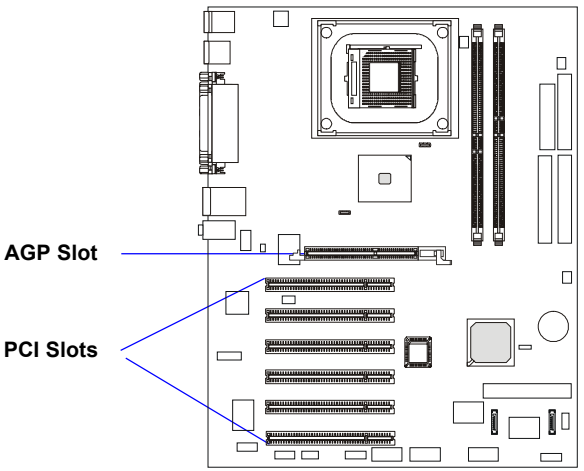


MSI Reminds You...

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one AGP slot and six 32-bit PCI bus slots.



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory. The mainboard supports 4x/8x 1.5V AGP card.

PCI (Peripheral Component Interconnect) Slots

The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT B#	INT C#	INT D#	INT A#
PCI Slot 2	INT A#	INT B#	INT C#	INT D#
PCI Slot 3	INT B#	INT C#	INT D#	INT A#
PCI Slot 4	INT C#	INT D#	INT A#	INT B#
PCI Slot 5	INT D#	INT A#	INT B#	INT C#
PCI Slot 6	INT A#	INT B#	INT C#	INT D#

BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use. You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General help, only for Status Page Setup Menu and Option Page Setup Menu
<F5>	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
<F6>	Load the default CMOS value from Fail-Safe default table, only for Option Page Setup Menu
<F7>	Load Optimized defaults
<F10>	Save all the CMOS changes and exit

Getting Help

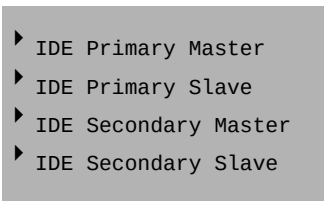
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the control keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu containing additional options can be launched from this field. You can use control keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press <Esc >.



General Help <F1>

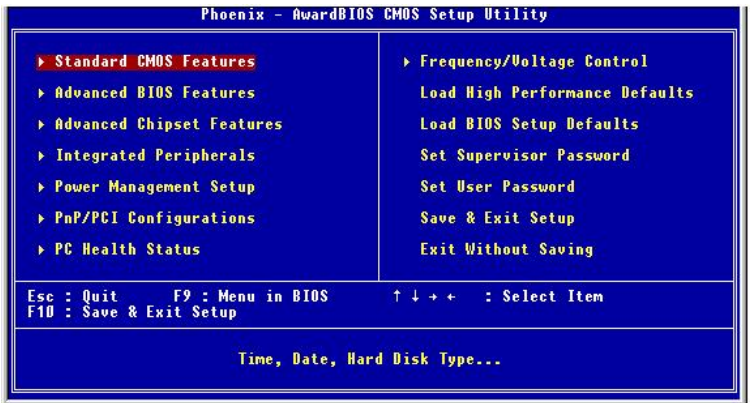
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

MSI Reminds You...

The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.

The Main Menu

Once you enter Phoenix-Award BIOS CMOS Setup Utility, the Main Menu (Figure 1) will appear on the screen. The Main Menu allows you to select from twelve setup functions and two exit choices. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

Advanced BIOS Features
Use this menu to setup the items of special enhanced features.

Advanced Chipset Features
Use this menu to change the values in the chipset registers and optimize your system's performance.

Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

Power Management Setup
Use this menu to specify your settings for power management.

PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

PC Health Status
This entry shows your PC health status.

Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control.

Load High Performance Defaults
Use this menu to load factory default settings into the BIOS for stable system performance operations.

Load BIOS Setup Defaults
Use this menu to load the BIOS values for the best system performance, but the system stability may be affected.

Set Supervisor Password
Use this menu to set Supervisor Password.

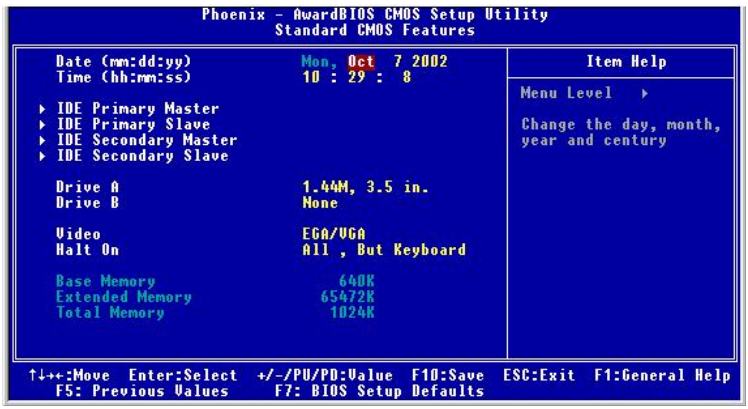
Set User Password
Use this menu to set User Password.

Save & Exit Setup
Save changes to CMOS and exit setup.

Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu are divided into 11 categories. Each category includes no, one or more than one setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Mon, Oct 7 2002
Time (hh:mm:ss) 10 : 29 : 8
IDE Primary Master
IDE Primary Slave
IDE Secondary Master
IDE Secondary Slave
Drive A 1.44M, 3.5 in.
Drive B None
Video EGA/VGA
Halt On All , But Keyboard
Base Memory 640K
Extended Memory 65472K
Total Memory 1024K
Item Help
Menu Level ▸
Change the day, month, year and century
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

Date

The date format is <day> <month> <date> <year>.

day Day of the week, from Sun to Sat. (Read only)
month The month from Jan. through Dec.
date The date from 1 to 31 can be keyed by numeric function keys.
year The year can be adjusted by users.

Time

The time format is <hour> <minute> <second>.

IDE Primary/Secondary Master/Slave

Press PgUp/<+> or PgDn/<-> to select *Manual*, *None* or *Auto* type. Note that the specifications of your drive must match with the drive table. The hard disk will not work properly if you enter improper information for this category. If your hard disk drive type is not matched or listed, you can use *Manual* to define your own drive type manually.

If you select *Manual*, related information is asked to be entered to the follow

ing items. Enter the information directly from the keyboard. This information should be provided in the documentation from your hard disk vendor or the system manufacturer.

Access Mode	The settings are CHS, LBA, Large, Auto.
Capacity	The formatted size of the storage device.
Cylinder	Number of cylinders.
Head	Number of heads.
Precomp	Write precompensation.
Landing Zone	Cylinder location of the landing zone.
Sector	Number of sectors.

Drive A/B

This item allows you to set the type of floppy drives installed. Available options: *None, 360K, 5.25 in., 1.2M, 5.25 in., 720K,* 3.5 in., *1.44M, 3.5 in., 2. 88M, 3.5 in.*

Video

The setting controls the type of video adapter used for the primary monitor of the system. Available options: *EGA/VGA , CGA 40, CGA 80, MONO*.

Halt On

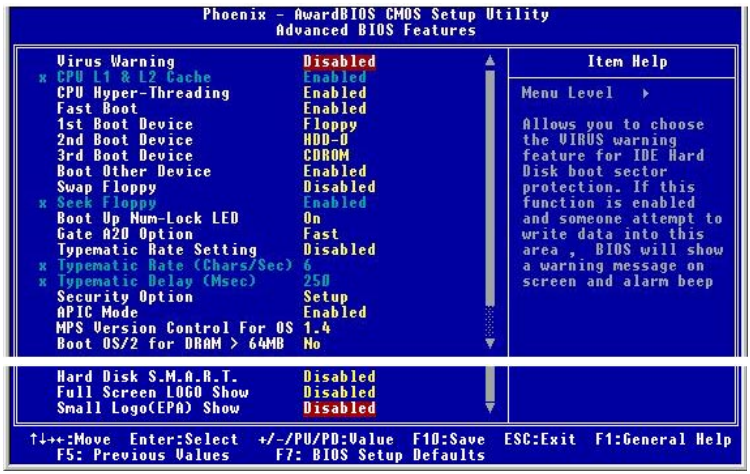
The setting determines whether the system will stop if an error is detected at boot. Available options are:

All Errors	The system stops when any error is detected.
No Errors	The system doesn't stop for any detected error.
All, But Keyboard	The system doesn't stop for a keyboard error.
All, But Diskette	The system doesn't stop for a disk error.
All, But Disk/Key	The system doesn't stop for either a disk or a keyboard error.

Base/Extended/Total Memory

The three items show the memory status of your system (read only).

Advanced BIOS Features


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
Virus Warning Disabled
x CPU L1 & L2 Cache Enabled
CPU Hyper-Threading Enabled
Fast Boot Enabled
1st Boot Device Floppy
2nd Boot Device HDD-0
3rd Boot Device CDROM
Boot Other Device Enabled
Swap Floppy Disabled
x Seek Floppy Enabled
Boot Up Num-Lock LED On
Gate A20 Option Fast
Typematic Rate Setting Disabled
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option Setup
APIC Mode Enabled
MPS Version Control For OS 1.4
Boot OS/2 for DRAM > 64MB No
Hard Disk S.M.A.R.T. Disabled
Full Screen LOGO Show Disabled
Small Logo(EPA) Show Disabled
Item Help
Menu Level
Allows you to choose the VIRUS warning feature for IDE Hard Disk boot sector protection. If this function is enabled and someone attempt to write data into this area , BIOS will show a warning message on screen and alarm beep
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

Virus Protection

The item is to set the Virus Warning feature for IDE Hard Disk boot sector protection. If the function is enabled and any attempt to write data into this area is made, BIOS will display a warning message on screen and beep. Settings: *Disabled, Enabled.*

CPU L1 & L2 Cache

The item allows you to turn on or off CPU's internal (L1) and external (L2) cache. Settings: *Enabled, Disabled.*

MSI Reminds You...

Enabling the functionality of Hyper-Threading Technology for your computer system requires ALL of the following platform Components:

**CPU: An Intel® Pentium® 4 Processor with HT Technology;*

**Chipset: An Intel® Chipset that supports HT Technology;*

**BIOS: A BIOS that supports HT Technology and has it enabled; and*

**OS: An operating system that supports HT Technology.*

For more information on Hyper-threading Technology, go to:

www.intel.com/info/hyperthreading

CPU Hyper-Threading
The processor uses Hyper-Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Settings: *Enabled, Disabled.*

Fast Boot
The option speeds up Power On Self Test (POST) after you power on the computer. When setting the item to *Enabled*, BIOS will shorten or skip some check items during POST. Settings: *Enabled, Disabled.*

1st/2nd/3rd Boot Device
The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system. The settings are:

Floppy	The system will boot from floppy drive.
LS120	The system will boot from LS-120 drive.
HDD-0	The system will boot from the first HDD.
SCSI	The system will boot from the SCSI.
CDROM	The system will boot from the CD-ROM.
HDD-1	The system will boot from the second HDD.
HDD-2	The system will boot from the third HDD.
HDD-3	The system will boot from the fourth HDD.
ZIP100	The system will boot from ATAPI ZIP drive.
USB-FDD	The system will boot from USB-interfaced floppy drive.
USB-ZIP	The system will boot from any USB-interfaced ZIP drive.
USB-CDROM	The system will boot from the USB-interfaced CD-ROM.
USB-HDD	The system will boot from the USB-interfaced HDD.
LAN	The system will boot from the Network drive.
Disabled	Disable this sequence.

MSI Reminds You...
1. Available settings for "1st/2nd/3rd Boot Device" vary depending on the bootable devices you have installed. For example, if you did not install a floppy drive, the setting "Floppy" does not show up.
*2. If you want to boot from any of the USB-interfaced devices, please set **USB Legacy Support** to **All Device**.*

Boot Other Device
Setting the option to *Enabled* allows the system to try to boot from other device if the system fails to boot from the 1st/2nd/3rd boot device.

Swap Floppy
Setting to *Enabled* will swap floppy drives A: and B:.

Seek Floppy
Setting to *Enabled* will make BIOS seek floppy drive A: before booting the system. Settings: *Disabled*, *Enabled*.

Boot Up Num-Lock LED
This setting is to set the Num Lock status when the system is powered on. Setting to *On* will turn on the Num Lock key when the system is powered on. Setting to *Off* will allow users to use the arrow keys on the numeric keypad. Setting options: *On*, *Off*.

Typematic Rate Setting
This item is used to enable or disable the typematic rate setting including Typematic Rate & Typematic Delay.

> **Typematic Rate (Chars/Sec)**
> After *Typematic Rate Setting* is enabled, this item allows you to set the rate (characters/second) at which the keys are accelerated. Settings: *6*, *8*, *10*, *12*, *15*, *20*, *24*, *30*.
>
> **Typematic Delay (Msec)**
> This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.Typematic Delay (Msec)
> This item allows you to select the delay between when the key was first pressed and when the acceleration begins. Settings: *250*, *500*, *750* and *1000*.

Security Option
This specifies the type of BIOS password protection that is implemented. Settings are described below:

Option	Description
Setup	The password prompt appears only when end users try to run Setup.
System	A password prompt appears every time when the computer is powered on or when end users try to run Setup.

APIC Mode
This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance to PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQs resources for the system. Settings: *Enabled*, *Disabled*.

MPS Version Control For OS
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system. Settings: *1.4*, *1.1*.

Boot OS/2 for DRAM > 64MB
This allows you to run the OS/2® operating system with DRAM greater than 64MB. Setting options: *No*, *Yes*.

Hard Disk S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline. Settings: *Enabled* and *Disabled*.

Full Screen LOGO Show
This item enables you to show the company logo on the bootup screen. Settings are:

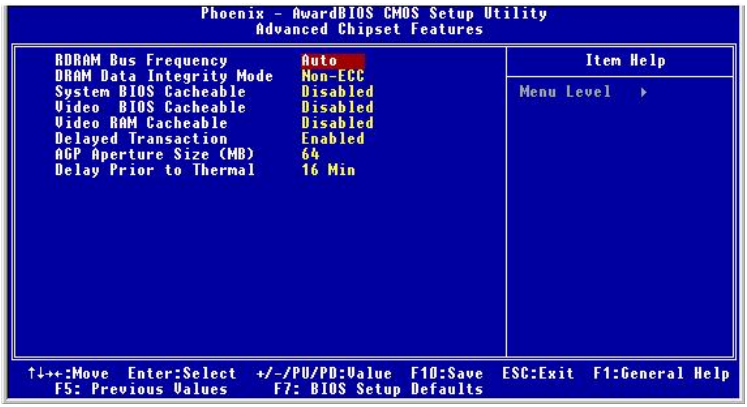
Enabled	Shows a still image (logo) on the full screen at boot.
Disabled	Shows the POST messages at boot.

Small Logo (EPA) Show

This item enables you to show the EPA logo (brand specific graphics) on the bootup screen. Settings are:

Disabled	Shows the normal POST screen at boot.
Enabled	Shows a still image (EPA logo) on the screen at boot.

Advanced Chipset Features


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
RDRAM Bus Frequency Auto
DRAM Data Integrity Mode Non-ECC
System BIOS Cacheable Disabled
Video BIOS Cacheable Disabled
Video RAM Cacheable Disabled
Delayed Transaction Enabled
AGP Aperture Size (MB) 64
Delay Prior to Thermal 16 Min
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

MSI Reminds You...
Change these settings only if you are familiar with the chipset.

RDRAM Bus Frequency
Use this item to configure the bus frequency of the installed RDRAMs. Setting options: *Auto*, *300MHz*, *400MHz*, *533MHz*.

DRAM Data Integrity Mode
Select *ECC* (Error-Checking & Correcting Code) or *Non-ECC* according to the type of DRAM installed.

System BIOS Cacheable
Selecting *Enabled* allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result. Setting options: *Enabled*, *Disabled*.

Video BIOS Cacheable
Selecting *Enabled* allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result. Setting options: *Disabled*, *Enabled*.

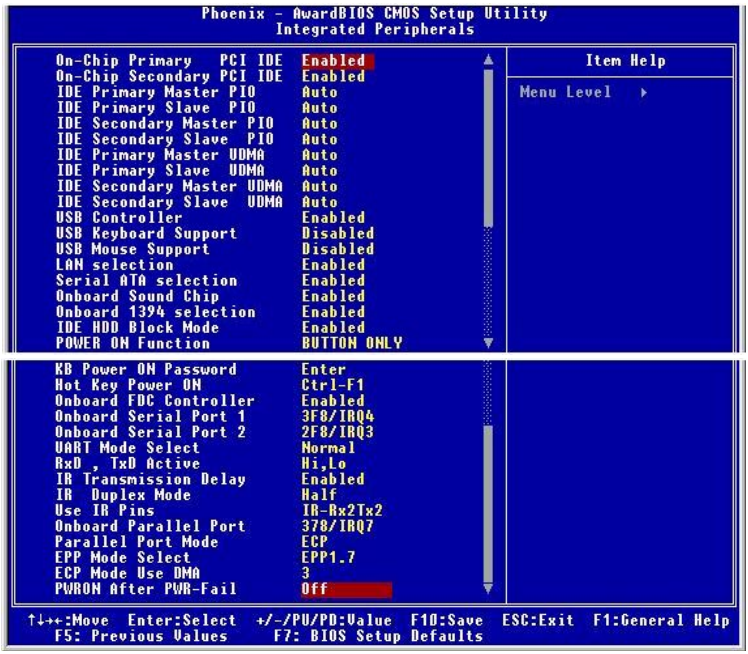
Video RAM Cacheable
Selecting *Enabled* allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result. Setting options: *Disabled, Enabled*.

Delayed Transaction
The chipset has an embedded 32-bit posted write buffer to support delayed transactions cycles so that transactions to and from the ISA bus are buffered and PCI bus can perform other transactions while the ISA transaction is underway. Select *Enabled* to support compliance with PCI specification version 2.1. Setting options: *Enabled, Disabled*.

AGP Aperture Size (MB)
This setting controls just how much system RAM can be allocated to AGP for video purposes. The aperture is a portion of the PCI memory address range dedicated to graphics memory address space. Host cycles that hit the aperture range are forwarded to the AGP without any translation. The option allows the selection of an aperture size of *4MB, 8MB, 16MB, 32MB, 64MB, 128MB, and 256 MB.*

Delay Prior to Thermal
When the CPU temperature reaches a factory preset level, a thermal monitoring mechanism will be enabled following the appropriate timing delay specified in this field. With the thermal monitoring enabled, clock modulation controlled by the processor's internal thermal sensor is also activated to keep the processor within allowable temperature limit. Setting options: *4 Min, 8 Min, 16 Min, 32 Min.*

Integrated Peripherals


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
On-Chip Primary PCI IDE Enabled
On-Chip Secondary PCI IDE Enabled
IDE Primary Master PIO Auto
IDE Primary Slave PIO Auto
IDE Secondary Master PIO Auto
IDE Secondary Slave PIO Auto
IDE Primary Master UDMA Auto
IDE Primary Slave UDMA Auto
IDE Secondary Master UDMA Auto
IDE Secondary Slave UDMA Auto
USB Controller Enabled
USB Keyboard Support Disabled
USB Mouse Support Disabled
LAN selection Enabled
Serial ATA selection Enabled
Onboard Sound Chip Enabled
Onboard 1394 selection Enabled
IDE HDD Block Mode Enabled
POWER ON Function BUTTON ONLY
KB Power ON Password Enter
Hot Key Power ON Ctrl-F1
Onboard FDC Controller Enabled
Onboard Serial Port 1 3F8/IRQ4
Onboard Serial Port 2 2F8/IRQ3
UART Mode Select Normal
RxD , TxD Active Hi,Lo
IR Transmission Delay Enabled
IR Duplex Mode Half
Use IR Pins IR-Rx2Tx2
Onboard Parallel Port 378/IRQ7
Parallel Port Mode ECP
EPP Mode Select EPP1.7
ECP Mode Use DMA 3
PWRON After PWR-Fail Off
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

On-Chip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Choose *Enabled* to activate each channel separately.

IDE Primary/Secondary Master/Slave PIO
The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In *Auto* mode, the system automatically determines the best mode for each device. The settings are: *Auto*, *Mode 0*, *Mode 1*, *Mode 2*, *Mode 3*, *Mode 4*.

IDE Primary/Secondary Master/Slave UDMA
Ultra DMA/33/66/100 implementation is possible only if your IDE hard drive supports it and the operating environment includes a DMA driver (Windows

95 OSR2 or a third-party IDE bus master driver). If your hard drive and your system software both support Ultra DMA/33, Ultra DMA/66 or even Ultra DMA/100, select *Auto* to enable BIOS support. Settings: *Auto, Disabled*.

USB Controller
Select *Enabled* if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. Settings: *Enabled, Disabled*.

USB Keyboard/Mouse Support
Set to *Enabled* if your need to use a USB keyboard/mouse in the operating system that does not support or have any USB driver installed, such as DOS and SCO Unix.

LAN Selection
The field determines whether the onboard LAN controller is activated. Setting options: *Enabled, Disabled.*

Serial ATA Selection
The field determines whether the onboard Serial ATA controller is activated. Setting options: *Enabled, Disabled*.

Onboard Sound Chip
The field determines whether the onboard audio controller is activated. Setting options: *Enabled, Disabled.*

Onboard 1394 Selection
The field determines whether the onboard IEEE1394 controller is activated. Setting options: *Enabled, Disabled*.

IDE HDD Block Mode
Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select *Enabled* for automatic detection of the optimal number of block read/writes per sector the drive can support. Settings: *Enabled, Disabled*.

POWER ON Function
This controls how the PS/2 mouse or keyboard can power on the system. Available settings are: *Password, Hot KEY, BUTTON ONLY, Keyboard 98.*

KB Power ON Password
If POWER ON Function is set to Password, then you can set a password in the field for the PS/2 keyboard to power on the system.

Hot Key Power ON
If POWER ON Function is set to Hot KEY, you can assign a hot key combination in the field for the PS/2 keyboard to power on the system. Settings: *Ctrl-F1 through Ctrl-F12.*

Onboard FDC Controller
The item is used to enable or disable the onboard Floppy controller. Select *Enabled* when you have installed a floppy disk drive and want to use it.

Onboard Serial Port 1/2
The items specify the base I/O port address and IRQ for the onboard Serial Port 1 (COM A)/Serial Port 2 (COM B). Selecting *Auto* allows BIOS to automatically determine the correct base I/O port address. Settings: *Disabled, 3F8/IRQ4, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3, Auto.*

UART Mode Select
This setting allows you to specify the operation mode for serial port 2. Setting options: *IrDA, ASKIR, Normal.*

IrDA	IrDA-compliant Serial Infrared Port
ASKIR	Amplitude Shift Keyed Infrared Port
Normal	RS-232C Serial Port

RxD, TxD Active
This setting controls the receiving and transmitting speed of the IR peripheral in use. Setting options: *Hi,Hi, Hi,Lo, Lo,Hi, Lo,Lo*.

IR Transmission Delay
This setting determines whether the IR transmission rate will be delayed while converting to receiving mode. Setting options: *Disabled, Enabled.*

IR Duplex Mode
This setting controls the operating mode of IR transmission/reception. Setting options: *Full, Half.* Under Full Duplex mode, synchronous, bi-directional transmission/reception is allowed. Under Half Duplex mode, only asynchronous, bi-directional transmission/reception is allowed.

Use IR Pins
Please consult your IR peripheral documentation to select the correct setting of the TxD and RxD signals. Setting options: *RxD2,TxD2, IR-Rx2Tx2.*

Onboard Parallel Port
This specifies the I/O port address and IRQ of the onboard parallel port. Settings: *378/IRQ7, 278/IRQ5, 3BC/IRQ7, Disabled.*

Parallel Port Mode
This item selects the operating mode for the parallel port: *SPP, EPP, ECP,* or *ECP+EPP, Normal.*

SPP: Standard Parallel Port
EPP: Enhanced Parallel Port
ECP: Extended Capability Port
ECP + EPP: Extended Capability Port + Enhanced Parallel Port

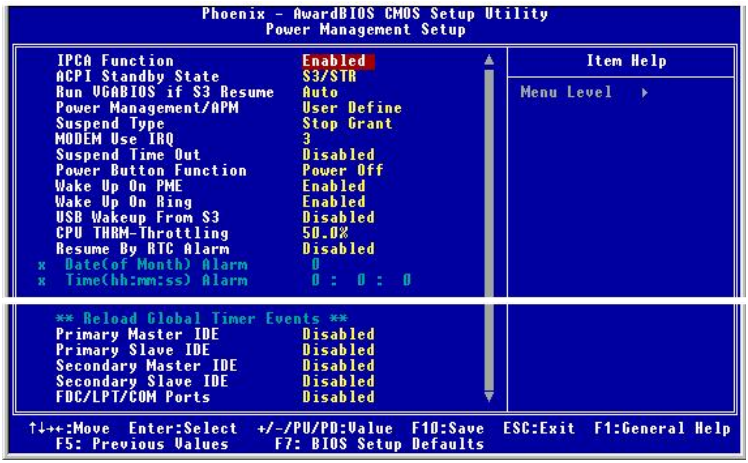
EPP Mode Select
The onboard parallel port is EPP Spec. compliant, so after the user chooses the onboard parallel port with the EPP function, the setting "EPP Version" should be set. At this time either *1.7* spec or *1.9* spec can be chosen.

ECP Mode Use DMA
The ECP mode has to use the DMA channel, so after the user chooses the onboard parallel port with the ECP feature, the setting "ECP Mode User DMA" should be set. At this time, the user can choose between DMA channel *3* or *1*.

PWRON After PWF-Fail
This item specifies whether your system will reboot after a power failure or interrupt occurs. Available settings are:

Off	Leaves the computer in the power off state
On	Leaves the computer in the power on state
Former-Sts	Restores the system to the status before power failure or interrupt occurred.

Power Management Setup


Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
IPCA Function Enabled
ACPI Standby State S3/STR
Run VGABIOS if S3 Resume Auto
Power Management/APM User Define
Suspend Type Stop Grant
MODEM Use IRQ 3
Suspend Time Out Disabled
Power Button Function Power Off
Wake Up On PME Enabled
Wake Up On Ring Enabled
USB Wakeup From S3 Disabled
CPU THRM-Throttling 50.0%
Resume By RTC Alarm Disabled
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
** Reload Global Timer Events **
Primary Master IDE Disabled
Primary Slave IDE Disabled
Secondary Master IDE Disabled
Secondary Slave IDE Disabled
FDC/LPT/COM Ports Disabled
Item Help
Menu Level
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

MSI Reminds You...

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

IPCA Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows® 98SE/2000/ME, select *Enabled*. Settings: *Enabled*, *Disabled*.

ACPI Standby State

This item specifies the power saving modes for ACPI function. Options are:

S1/POS The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

S3/STR The S3 sleep mode is a lower power state where the information of system configuration and open applications/

files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a "wake up" event occurs.

Run VGABIOS if S3 Resume
Selecting *Enabled* allows BIOS to call VGA BIOS to initialize the VGA card when system wakes up (resumes) from S3 sleep state. The system resume time is shortened when you disable the function, but system will need an AGP driver to initialize the VGA card. Therefore, if the AGP driver of the card does not support the initialization feature, the display may work abnormally or not function after resuming from S3.

Power Management/APM
This item is used to select the degree (or type) of power saving and is related to the mode: *Suspend Time Out*. There are three options for power management:

Min Saving	Minimum Power Management. Suspend Time Out = 1 Hour.
Max Saving	Maximum Power Management. Suspend Time Out = 1 Min.
User Define	Allows end users to configure the Suspend Time Out field.

Suspend Type
This setting allows you to select the type of Suspend mode. Setting options: *Stop Grant* (saves the state of the entire system to disk and then powers off the system), *PwrOn Suspend* (the CPU and core system remain powered on in a very low-power state).

MODEM Use IRQ
This setting names the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system. Setting options: *3, 4, 5, 7, 9, 10, 11, NA.*

Suspend Time Out
If system activity is not detected for the length of time specified in this field, all devices except CPU will be shut off. Settings: *Disabled, 1 Min, 2*

Min, 4 Min, 8 Min, 12 Min, 20 Min, 30 Min, 40 Min, 1 Hour.

Power Button Function
This feature allows users to configure the power button function. Settings are:

Power Off	The power button functions as a normal power-on/ -off button.
Suspend	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

Wake Up On PME/Ring, USB Wakeup From S3
These fields specify whether the system will be awakened from power saving modes when activity or input signal of the specified hardware peripheral or component is detected.

MSI Reminds You...
To use the function of "Wake Up On Ring", you need to install a modem card supporting power on function.

CPU THRM-Throttling
When CPU's temperature is higher than the predefined thermal level, the thermal monitoring mechanism will slow down the CPU speed to the percentage specified in the field. Settings range from *12.5%* to *87.5%* at 12.5% increment.

Resume By RTC Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

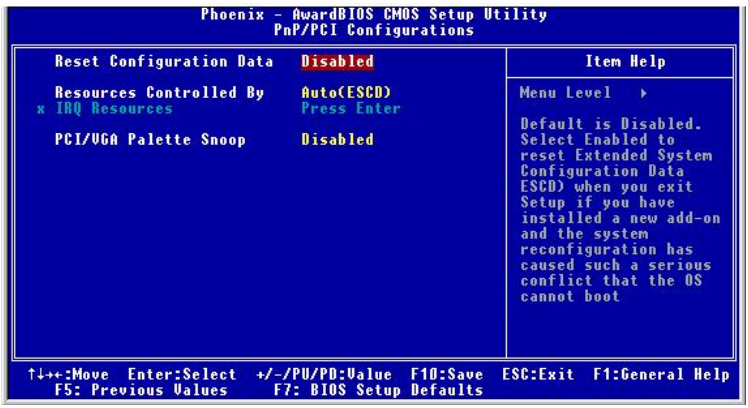
Date(of Month) Alarm
The field specifies the date for *Resume By RTC Alarm*. Settings: 0~31.

Time(hh:mm:ss) Alarm
The field specifies the time for *Resume By RTC Alarm*. Format is <hour> <minute><second>.

**** Reload Global Timer Events ****
Primary/Secondary Master/Slave IDE, FDC/LPT/COM Ports
The global timer is the hardware timer that counts down to the power saving modes. If the monitoring of the listed hardware peripherals or components is enabled, the activity of the specified peripherals or components will awaken the system or reload the original count of global timer when they are accessed.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Reset Configuration Data
Disabled
Resources Controlled By
Auto(ESCD)
x IRQ Resources
Press Enter
PCI/VGA Palette Snoop
Disabled
Item Help
Menu Level ▸
Default is Disabled. Select Enabled to reset Extended System Configuration Data ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious conflict that the OS cannot boot
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5: Previous Values F7: BIOS Setup Defaults

Reset Configuration Data

Normally, you leave this field *Disabled*. Select *Enabled* to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on card and the system reconfiguration has caused such a serious conflict that the operating system can not boot. Settings: *Enabled*, *Disabled*.

Resources Controlled By

The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows® 98/2000. If you set this field to "manual", choose specific resources by going into each sub-menu that follows this field. Settings: *Auto (ESCD)*, *Manual*.

IRQ Resources

The items are adjustable only when *Resources Controlled By* is set to *Manual*. Press <Enter> and you will enter the sub-menu of the items. IRQ Resources list IRQ 3/4/5/7/9/10/11/12/14/15 for users to set each IRQ a type depending on the type of device using the IRQ. Settings are:

PCI Device	For Plug & Play compatible devices designed for PCI bus architecture.
Reserved	The IRQ will be reserved for further request.

PCI/VGA Palette Snoop

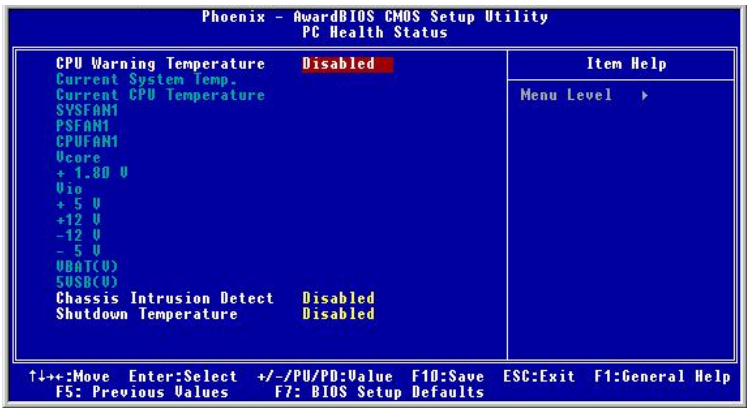
When set to *Enabled*, multiple VGA devices operating on different buses can handle data from the CPU on each set of palette registers on every video device. Bit 5 of the command register in the PCI device configuration space is the VGA Palette Snoop bit (0 is disabled). For example, if there are two VGA devices in the computer (one PCI and one ISA) and the:

VGA Palette Snoop Bit Setting	Action
Disabled	Data read or written by the CPU is only directed to the PCI VGA device's palette registers.
Enabled	Data read or written by the CPU is directed to both the PCI VGA device's palette registers and the ISA VGA device's palette registers, permitting the palette registers of both VGA devices to be identical.

The setting must be set to *Enabled* if any ISA bus adapter in the system requires VGA palette snooping.

PC Health Status

This section shows the status of your CPU, fan, overall system status, etc. Monitor function is available only if there is hardware monitoring mechanism onboard.



CPU Warning Temperature

This item is used to specify a thermal limit for CPU. If CPU temperature reaches the specified limit, the system will issue a warning which allows you to prevent the CPU overheat problem. Settings: *Disabled, 50°C/122°F, 53°C/127°F, 56°C/133°F, 60°C/140°F, 63°C/145°F, 66°C/151°F* and *70°C/158°F*.

Current System/CPU Temperature, SYSFAN1/PSFAN1/CPUFAN1, Vcore, +1.80V, Vio, +5V, +12V, -12V, -5V, VBAT(V), 5VSB(V)

These items display the current status of all of the monitored hardware devices/components such as CPU voltages, temperatures and all fans' speeds.

Chassis Intrusion Detect

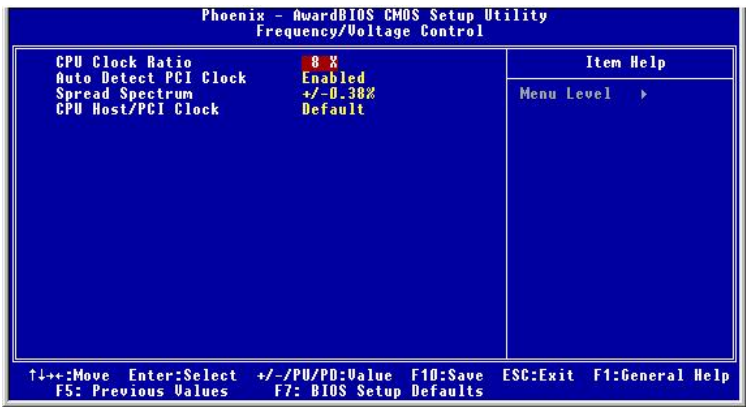
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to *Reset.* The setting of the field will automatically return to *Enabled* later. Settings: *Enabled*, *Reset*, *Disabled*.

Shutdown Temperature

When the processor reaches the preset temperature, the ACPI-aware system will be shut down. Settings: *Disabled, 60°C/140°F, 65°C/149°F, 70°C/158°F, 75°C/167°F*.

Frequency/Voltage Control

Use this menu to specify your settings for frequency/voltage control.



CPU Clock Ratio
End users can overclock the processor by specifying the CPU ratio (clock multiplier) in this field. Options: key in a DEC number between 8 and 50.

Auto Detect PCI Clock
This item is used to auto detect the PCI slots. When set to *Enabled*, the system will remove (turn off) clocks from empty PCI slots to minimize the electromagnetic interference (EMI). Settings: *Enabled*, *Disabled*.

Spread Spectrum
When the motherboard's clock generator pulses, the extreme values (spikes) of the pulses creates EMI (Electromagnetic Interference). The Spread Spectrum function reduces the EMI generated by modulating the pulses so that the spikes of the pulses are reduced to flatter curves. If you do not have any EMI problem, leave the setting at *Disabled* for optimal system stability and performance. But if you are plagued by EMI, activate the Spread Spectrum for EMI reduction. Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clockspeed which may just cause your overclocked processor to lock up. Options: *Disabled, +/-0.25%, -0.5%, +/-0.5%, +/-0.38%*.

CPU Host/PCI Clock

This item specifies the clock frequency of CPU host bus (FSB) and PCI bus. It provides a method for end users to overclock the processor. If the item shows *Default*, the setting will use the default value for the clock frequency of CPU host bus and PCI bus. Options are: Default, 100/33, 101/33, 108/36, 114/38, 120/40, 123/41, 126/31, 133/33, 134/33, 148/37, 152/38, 156/39 (MHz).

MSI Reminds You...

Changing CPU Clock Ratio could result in the instability of the system; therefore, it is NOT recommended to change the default setting for long-term usage.

Load High Performance/BIOS Setup Defaults

The two options on the main menu allow users to restore all of the BIOS settings to High Performance defaults or BIOS Setup defaults. The High Performance Defaults are the values set by the mainboard manufacturer for the best system performance but probably will cause a stability issue. The BIOS Setup Defaults are the default values also set by the mainboard manufacturer for stable performance of the mainboard.

When you select Load High Performance Defaults, a message as below appears:

Pressing 'Y' loads the default BIOS values that enable the best system performance but may lead to a stability issue.

MSI Reminds You...

The option is for power or overclocking users only. *Use of high performance defaults will tighten most timings to increase the system performance. Therefore, a high-end system configuration is a must, which means you need high-quality VGA adapter, RAM and so on.* ***We don't recommend that users should apply the high performance defaults in their regular systems.*** *Otherwise, the system may become unstable or even crash. If the system crashes or hangs after enabling the feature, please CLEAR CMOS DATA to resolve the problem. For more information, refer to "Clear CMOS Jumper:JBAT1" in Chapter 2.*

When you select Load BIOS Setup Defaults, a message as below appears:

Pressing 'Y' loads the default values that are factory settings for stable system performance.

Set Supervisor/User Password

When you select this function, a message as below will appear on the screen:

Type the password, up to eight characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Additionally, when a password is enabled, you can also have BIOS to request a password each time the system is booted. This would prevent unauthorized use of your computer. The setting to determine when the password prompt is required is the Security Option of the Advanced BIOS Feature menu. If the Security Option is set to *System*, the password is required both at boot and at entry to Setup. If set to *Setup*, password prompt only occurs when you try to enter Setup.

MSI Reminds You...
About Supervisor Password & User Password:

Supervisor password:	*Can enter and change the settings of the setup menu.*
User password:	*Can only enter but do not have the right to change the settings of the setup menu.*

Appendix A: Using 4- or 6-Channel Audio Function

The motherboard comes with C-Media 8738MX/LX chip, which provides support for 6-channel audio output, including 2 Front, 2 Rear, 1 Center and 1 Subwoofer channel SPDIF out. C-Media 8738MX/LX allows the board to attach 4 or 6 speakers for better surround sound effect. The section will tell you how to install and use 4-/6-channel audio function on the board.

TOPICS

Installing C-Media Drivers *A-2*
Hardware Configuration *A-3*
Software Configuration *A-4*
Using 4- or 6- Channel Audio Function *A-13*

Installing C-Media Drivers

The mainboard is able to transform the audio connectors on the back panel from 2-channel to 4-/6-channel. To use the function, you need to install the C-Media drivers.

To install C-Media drivers:

1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click on **C-Media Sound Drivers**.
3. Follow the on-screen instructions to complete installation.
4. Restart the system.

MSI Reminds You...
*For Windows NT4.0, you need to install the C-Media Sound Drivers **manually**.*

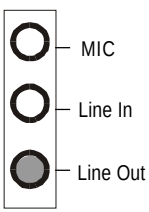
Hardware Configuration

After installing the audio driver, you are able to use the 4-/6-channel audio feature now. To enable 4- or 6-channel audio operation, first connect 4 or 6 speakers to the appropriate audio connectors, and then select 4- or 6-channel audio setting in the software utility.

There are two ways to utilize the function and connect the speakers to your computer:

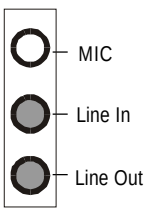
- *Use the optional S-Bracket.* If your motherboard supports S-Bracket and you have installed S-Bracket in the computer, you can connect two speakers to back panel's Line-Out connector, and the rest of speakers to S-Bracket.
- *Use the back panel only (without S-Bracket).* If you do not have a S-Bracket, you can connect all speakers to the audio connectors on the back panel.

After installing the C-Media drivers, you can attach the speakers for 4-/6-channel audio output. Always connect the speakers to the LINE OUT connectors. Different connector configurations for 2-/4-/6-channel operations are listed below:



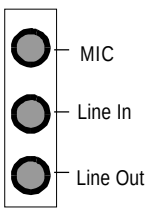
2-Channel

In 2-channel configuration, Line Out, Line In and MIC functions all exist.



4-Channel

When set to 4-channel configuration, LINE IN function DOES NOT WORK any more.



6-Channel

When set to 6-channel configuration, LINE IN and MIC functions DO NOT WORK anymore.

Software Configuration

To have 4-/6-channel audio work, you must set appropriate configuration in the C-Media software application.

To set the Volume control:

1. Click the C-Media Mixer icon from the window tray on the bottom.
2. The following screen appears. Click the VOL button.

3. Then you may adjust the following item:

Volume : This is the master control over all outputs. The power of an output signal is determined by both of the volume slider and the slider for the individual output. To modify all the outputs, adjust the volume slider. To change individual output(s), adjust its (their) slider(s).

CD: Regulates the CD drive audio input level.

MIC: Regulates the input level of microphone.

WAVE: Regulates wave (voice) playback levels.

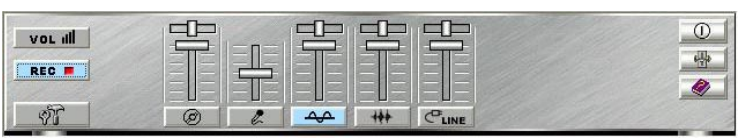
MIDI: Regulates the MIDI music play level.

LINE IN: Regulates the Line-in level.

Advanced: Regulates the advanced settings.

To set the Recording control:

1. Click the REC button.
2. Then you may adjust the following item:



CD: Regulates the CD drive audio input level.

MIC: Regulates the input level of microphone.

WAVE: Regulates wave (voice) playback levels.

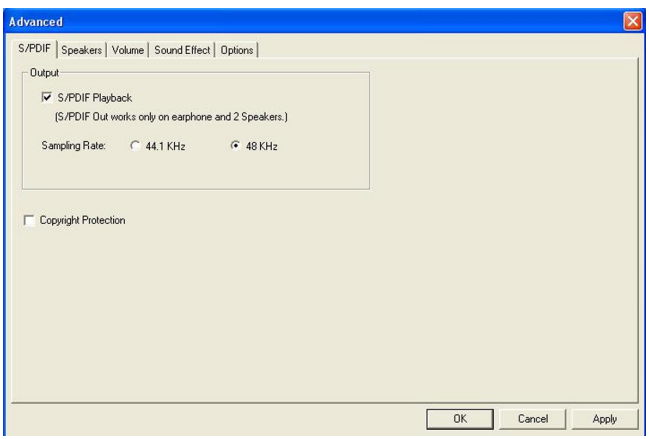
FM: Regulates the FM music play level.

LINE IN: Regulates the Line-in level.

Advanced: Regulates the advanced settings.

The Advanced-S/PDIF Dialog box:

1. Click the button.



2. To enable **SPDIF-OUT** should be under 2-channel speaker mode since SPDIF standard only supports 2ch PCM audio data. If users would like to transmit multi-channels audio through SPDIF, users should choose AC-3 Dolby encoded format or DTS like DVD titles. Users can choose **44.1K or 48K Hz** sampling rate of PCM data when using SPDIF-Out.

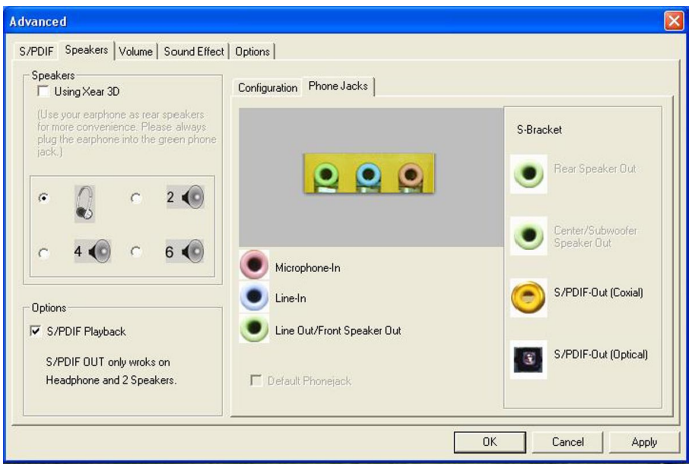
3. The **Copyright Protection** is to enable SPDIF Copyright bit. Then recording copyright-protected input data will be not available.

The Advanced-Speakers Dialog box

There are 2 different software configurations in the "Advanced-Speakers" dialog depending the C-Media chipset on your have.

➤ ***With C-Media 8738MX chipset:***

Use S/PDIF mode:



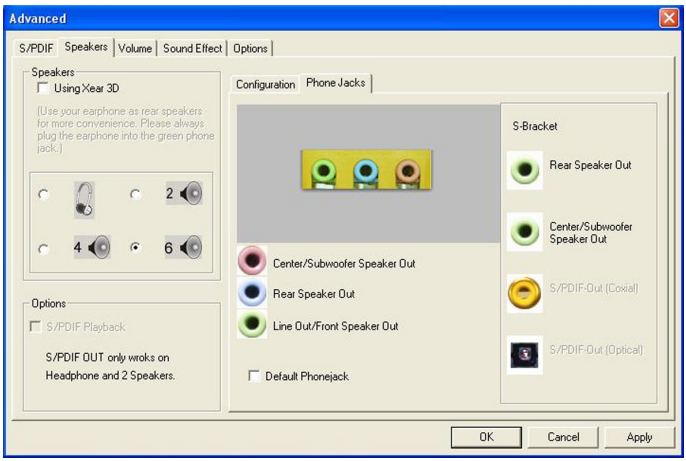
1. This diague provides an interface allowing you to set your speaker mode. CMI8738MX 6-channel supports earphone, 2ch, 4ch and 5.1ch mode.
2. The **Phone Jacks** tag shows the correct phone jack configuration for your motherboard.
3. Your should make sure what type your speakers are, and what the correct configurations are. You can always refer to this appendix to make sure whether or not the connections of your speakers and plugs are correct.

MSI Reminds You...

1. The "S/PDIF Playback" option in the "S/PDIF" dialog will be enabled when you choose "earphone" or "2" in the "Speaker" option.

2. The "S/PDIF (Coxial)" and "S/PDIF (Optical) outputs are also available when you enable the "S/PDIF Playback" option.

Use 6-channel:



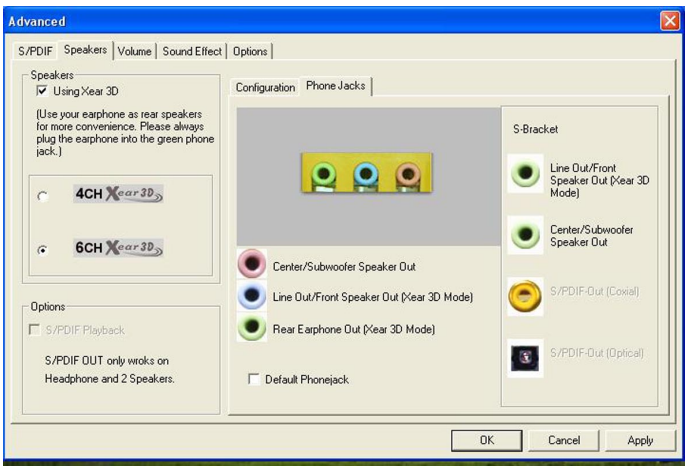
MSI Reminds You...

1. The "S/PDIF Playback" option in the "S/PDIF" dialog will be disabled when you choose "4" or "6" in the "Speaker" option.

2. Without using S-Bracket, the original "Microphone-in" will become "Center/Subwoofer Speaker Out" and the "Line-in" will become "Rear Speaker Out".

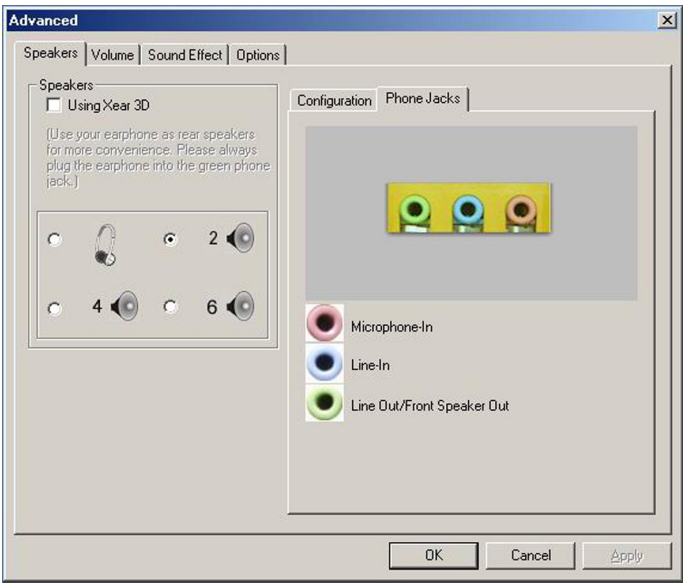
*3. Please be sure to enable the **Default Phonejack** option if you have the optional S-Bracket, which will make the "Center/ Subwoofer Speaker Out" as "micro-in" and the "Rear speaker Out" as "line-in"..*

Using Xear 3D:



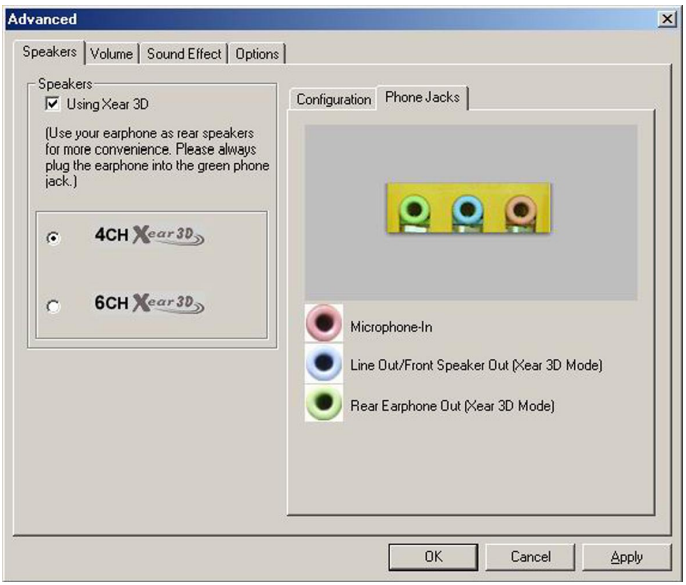
Xear 3D technology provides a different multi-channel listening method and environment settings. Users can use general open-style earphones to replace real speakers so that users will hear rear-out sounds from the earphone. Using Xear 3D technology, users will need less setup-up effort, cost and space without rear speakers. It will be also convenient for gamers to enjoy multi-channel 3D sound effect when playing games especially in Internet Cafe, which

➢ ***With C-Media 8738LX chipset:***



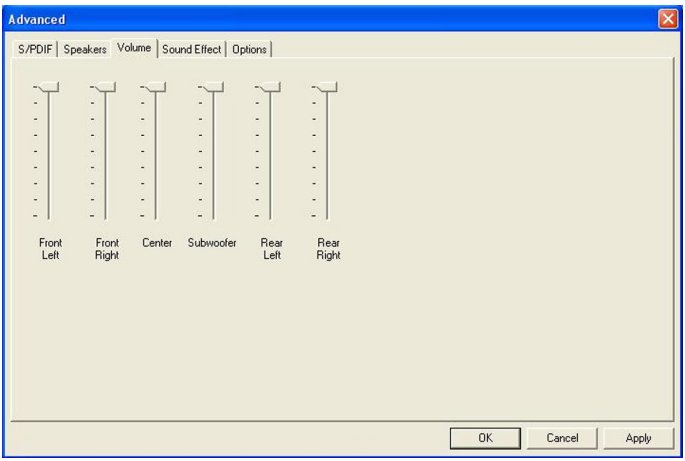
This diague provides an interface allowing you to set your speaker mode. CMI8738LX 6-channel spports earphone, 2ch, 4ch and 6ch mode.

Using Xear 3D:



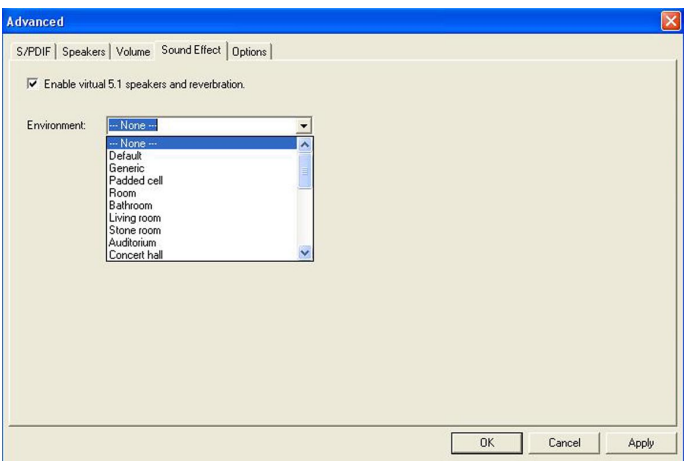
This diague provides an interface allowing you to set your speaker mode. CMI8738 LX 6-channel spports earphone, 4ch or 6ch mode in Xear 3D.

The Volume Dialog box:



The “Volume” dialog lets you adjust the volume of each output.

The Sound Effect box:

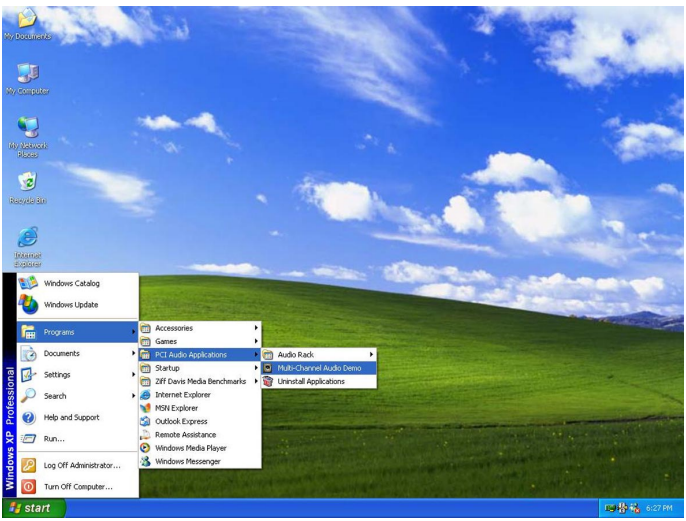


The “Sound Effect” dialog lets you choose the sound effect you like.

Multi-Channel Audio Demo:

You can use the "Multi-Channel Audio Demo" application to test the audio setting you are configuring/have configured.

The path will be showed as following:



Click on each audio output to test the sound effect and the sound configuration. ***Please note this demo will vary depending on your setting to the speakers.***

Using 4- or 6-Channel Audio Function

Attaching Speakers

To perform multichannel audio operation, connect multiple speakers to the system. You should connect the same number of speakers as the audio channels you will select in the software utility.

Using S-BRACKET connectors:

S-Bracket is an optional accessory. It gives access to analog and digital audio output by integrating both SPDIF (Sony & Philips Digital Interface) and analog LINE OUT connectors. To use the S-Bracket, you should select correct setting in the software utility. For information about the setting, refer to *Selecting 4- or 6-Channel Setting* later in the section.

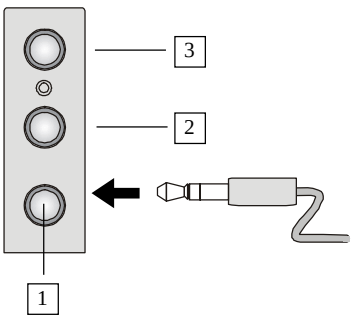
Connector configurations for 2-, 4- and 6-channel using S-Bracket are described below:

2-Channel Analog Audio Output

We recommend that you should still attach the speakers to BACK PANEL's Line Out connector during 2-channel audio mode even though S-Bracket's Line Out connectors function properly.

1 Line Out *(Front channels)*
2 Line In
3 MIC

Back Panel



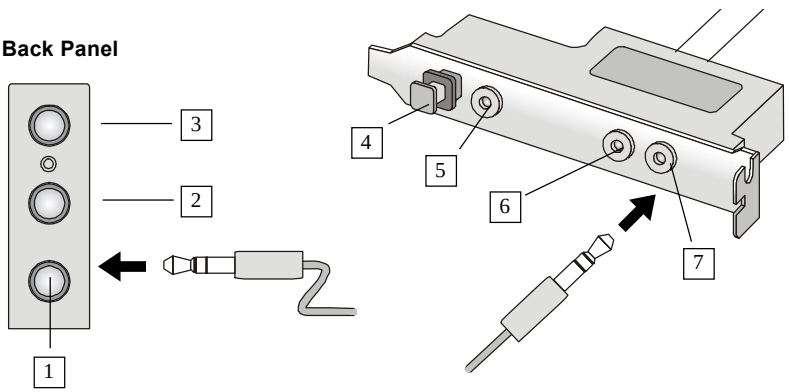
4-Channel Analog Audio Output

1 Line Out *(Front channels)*
2 Line In
3 MIC
4 Optical SPDIF jack
5 Coaxial SPDIF jack
6 Line Out *(Center and Subwoofer channel, but no functioning in this mode)*
7 Line Out *(Rear channels)*

Description:
Connect two speakers to back panel's Line Out connector and two speakers to one Line Out connector of S-Bracket.

S-Bracket

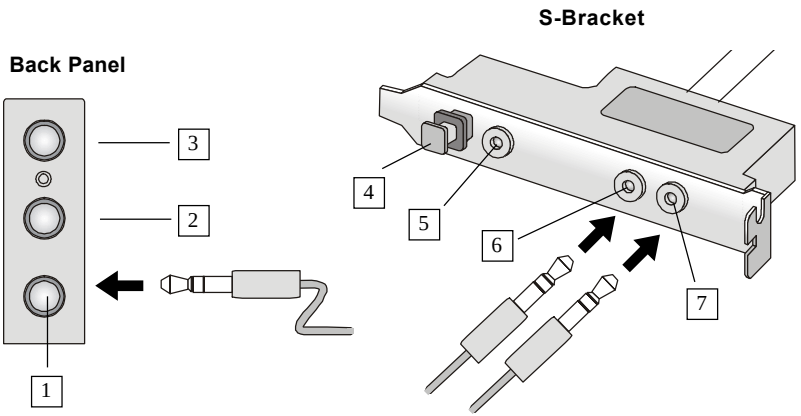
Back Panel



6-Channel Analog Audio Output

1. Line Out *(Front channels)*
2. Line In
3. MIC
4. Optical SPDIF jack
5. Coaxial SPDIF jack
6. Line Out *(Center and Subwoofer channel)*
7. Line Out *(Rear channels)*

Description:
Connect two speakers to back panel's Line Out connector and four speakers to both Line Out connectors of S-Bracket.



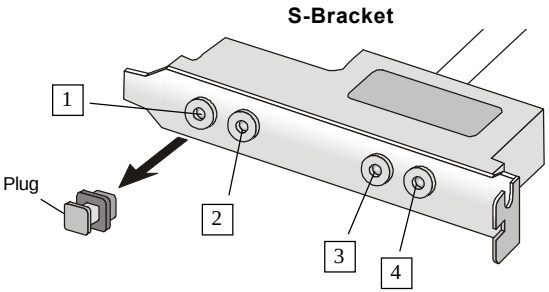
Digital Audio Output (2-Channel only)

For digital audio output, use the SPDIF (Sony & Philips Digital Interface) connectors supplied by *S-Bracket*. First, connect the SPDIF speakers to the appropriate SPDIF jack, and then select the audio channel you desire through the control panel of speakers. The SPDIF connectors support 2-channel audio operation only.

S-Bracket offers two types of SPDIF jacks: one for fiber-optic cable and the other for coaxial cable. Select the connector according to the type of your SPDIF speakers.

1 Optical SPDIF jack
2 Coaxial SPDIF jack
3 Line Out
4 Line Out

Description:
Select the correct type of SPDIF jack to connect SPDIF speakers. For optical connection, remove the plug from the S-Bracket before inserting the fiber-optic cable to it.



Troubleshooting

Q: Where will I find the model number of the mainboard?

A: There are two places where you can find the model number of the mainboard: 1. Somewhere between the PCI slots you shall find MS-xxxx or the marketing name like “K7T Turbo”. You can also find the version number beside it. 2. At the back cover of the user's manual.

Q: What do you mean by PCB version 1?

A: PCB is printed circuit board. Saying PCB version 1 is the same as saying motherboard version 1.

Q: Why my motherboard BIOS sticker is "Phoenix BIOS" but when I boot up my system I saw that "Award BIOS" is being used?

A: Phoenix & Award already merged as one company. All MSI motherboard using Award BIOS comes with Phoenix logo sticker.

Q: How do I know what MSI D-LED or D-bracket light mean?

A: Please follow the special tech issue, http://www.msi.com.tw/support/techexpress/special_tech/smartled.htm

Q: I have got MSI Motherboard and when it says detecting drives, it detects them but says an error saying "Primary IDE Channel no 80 Conductor Cable Installed"

A: This is not a problem. It merely means that you're using an ATA-66 or ATA-100 HDD, but you're using the conductor 40 ATA-33 cable.

Q: I have high speed CPU cooling fan like Taisol CGK760092, Vantec CCK-6035D & GlobalWin WBK38. Can I install the fan directly to the motherboard?

A: We strongly recommend that you do NOT connect those described CPU fan directly to your motherboard, as it draws so much power, that it could damage it. Please use a 3-Pin to 4-Pin Cable that comes together with the fan.

Q: Can I use more than 512MB memory on Win9x or WinME?

A: No, you can't. You can only use more than 512MB memory on Win2000 or WinXP. This is a Microsoft OS issue. Please check http://support/microsoft.com/support/kb/articles/Q108/0/79.ASP

Q: I have tried to download the MSI Live Update utility from http://www.msi.com.tw/support/liveupdate/livedriver.htm but it keeps on failing?

A: This can be solved by one of the following suggestions: 1. Dont install zonealarm 2. Disable "WebTrap" of PC-cillion 2000 3. Disable any web based anti-virus Software.

Q: Can Live Update Series support WinXP?

A: Live Update Series version 215 can support WinXP. Download it from http://www.msi.com.tw/support/liveupdate/livedriver.htm

Q: After flashing the BIOS, my system for unknown reason dont want to boot, what should I do?

A: Please refer to the following suggestions: 1. Try the BIOS boot recovery feature as described in http://www.msi.com.tw/support/bios/boot.htm 2. Try to clear the CMOS If problem still persists, ask your reseller for new BIOS chip or contact one of MSI office near your place for new BIOS chip http://www.msi.com.tw/contact/main.htm

Q: Should I update my BIOS, once a new BIOS is released?

A: A new BIOS is usually released due to the following reasons:

1. New function is supported
2. New BIOS source code

3. Bugs are found
4. Customer-specific request

When we release a new BIOS, there's usually a release note attached which lists the reason for the release. Refer to this release note and decide for yourself if upgrading to the new BIOS will be worth it. A word of advice, though, do not upgrade to the new BIOS, unless you really have to.

Q: How do I update the BIOS?

A: Please refer to http://www.msi.com.tw/support/bios/note.htm for details.

Q: How do I identify the BIOS version?

A: Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:

1. For older model number:

AG76 091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

2nd digit refers to the internal chipset code.

3rd digit refers to the processor class as 5 = 486, 7 = 586, 8 = 686.

4th digit is incremental.

091096 refers to the date this BIOS is released.

2. For newer model number:

W5139MS V1.0 091096 where:

1st digit refers to BIOS maker as A = AMI(R) W = AWARD(R) P = PHOENIX (R).

2nd - 5th digit refers to the model number.

6th - 7th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS version.

091096 refers to the date this BIOS is released.

Q: After flashing the bios and rebooting the system, the screen went blank.

A: ***For AMI BIOS***

Rename the desired AMI BIOS file to AMIBOOT.ROM and save it on a floppy disk. e.g. Rename A569MS23.ROM to AMIBOOT.ROM

Insert this floppy disk in the floppy drive. Turn On the system and press and hold Ctrl-Home to force update. It will read the AMIBOOT.ROM file and recover the BIOS from the A drive.

When 4 beeps are heard you may remove the floppy disk and restart the computer.

For Award BIOS

Make a bootable floopy disk

Copy the Award flash utility & BIOS file to the said floppy disk

Create an autoexec.bat with "awdfl535 biosfilename" in the content e.g. awdfl535a619mj21.bin

Boot up system with the said floppy (it will take less than 2 minutes before screen comes out)

Re-flash the BIOS & reboot.

Glossary

ACPI *(Advanced Configuration & Power Interface)*
This power management specification enables the OS (operating system) to control the amount of power given to each device attached to the computer. Windows 98/98SE, Windows 2000 and Windows ME can fully support ACPI to allow users managing the system power flexibly.

AGP *(Accelerated Graphics Port)*
A new, high-speed graphics interface that based on PCI construction and designed especially for the throughput demands of 3-D graphics. AGP provides a direct channel (32-bit wide bus) between the display controller and main memory for high graphics quality and performance.

Bluetooth
Bluetooth refers to a worldwide standard for the wireless exchange of data between two devices. Bluetooth requires that a low-cost transceiver chip be included in each device. The tranceiver transmits and receives in a previously unused frequency band of 2.45 GHz that is available globally (with some variation of bandwidth in different countries). In addition to data, up to three voice channels are available. Each device has a unique 48-bit address from the IEEE 802 standard. Connections can be point-to-point or multipoint. The maximum range is 10 meters. Data can be exchanged at a rate of 1 megabit per second (up to 2 Mbps in the second generation of the technology).

BIOS *(Basic Input/Output System)*
On PCs, an essential software that contains all the control code of input/output interface (such as keyboard, disk drives, etc.). It executes hardware test on booting the system, starts the OS, and provides an interface between the OS and the components. The BIOS is stored in a ROM chip.

Bus
A set of hardware lines within the computer system, through which the data is transferred among different components. In a PC, the term ***bus*** usually refers to a local bus that connects the internal components to the CPU and main memory.

Cache
A special memory subsystem that is used to speed up the data transfer. It stores the

contents of frequently accessed RAM locations and the addresses where these data items are stored.

Chipset
A collection of integrated chips designed to perform one or more related functions. For example, a modem chipset contains all the primary circuits for transmitting and receiving data; a PC chipset provides the electronic interfaces between all subsystems.

Clock Cycle
Clock cycle (or tick) is the smallest unit of time recognized by a device. For personal computers, clock cycles generally refer to the main system clock, which runs at 66 MHz. This means that there are 66 million clock cycles per second. Since modern CPUs run much faster (up to 533 MHz), the CPU can execute several instructions in a single clock tick.

CMOS *(Complementary Metal-Oxide Semiconductor)*
CMOS is a widely used type of semiconductor, which features high speed and low power consumption. PCs usually contain a small amount of battery-powered CMOS memory to retain the date, time, and system setup parameters.

DRAM *(Dynamic RAM)*
A most common type of computer memory. It usually uses one transistor and a capacitor to represent a bit. As the development of technology, the memory type and specification used in computer becomes variety, such as SDRAM, DDR SDRAM, and RDRAM. For further instruction, please see the table below:

Dynamic RAM (DRAM) Memory Technologies

Type	First Used	Clock Rate	Bus* Width	Peak Bandwidth	Volts
FPM (60,70ns)	1990	25MHz	64 bits	200 MBps	5v
EDO (50,60,70ns)	1994	40MHz	64 bits	320 MBps	5v
SDRAM (66MHz)	1996	66MHz	64 bits	528 MBps	3.3v
SDRAM (100MHz)	1998	100MHz	64 bits	800 MBps	3.3v
SDRAM (133MHz)	1999	133MHz	64 bits	1.1 GBps	3.3v
RDRAM (Direct Rambus)	1999	400MHz	16 bits	1.6 GBps	2.5v
DDR SDRAM (100MHz)	2000	100MHz	64 bits	1.6 GBps	3.3v
DDR SDRAM (133MHz)	2000	133MHz	64 bits	2.1 GBps	3.3v

* Memory channel width (64 bits started with 75MHz Pentium)

Source: Computer Desktop Encyclopedia

ECC Memory *(Error Correcting Code Memory)*
A type of memory that contains special circuitry for testing the accuracy of data and correcting the errors on the fly.

EEPROM
Acronym for Electrically Erasable Programmable Read-Only Memory. An EEPROM is a special type of PROM that can be erased by exposing it to an electrical charge. Like other types of PROM, EEPROM retains its contents even when the power is turned off. Also like other types of ROM, EEPROM is not as fast as RAM. EEPROM is similar to flash memory (sometimes called flash EEPROM). The principal difference is that EEPROM requires data to be written or erased one byte at a time whereas flash memory allows data to be written or erased in blocks. This makes flash memory faster.

EIDE
Short for Enhanced IDE, a newer version of the IDE mass storage device interface standard developed by Western Digital Corporation. It supports data rates of between 4 and 16.6 MBps, about three to four times faster than the old IDE standard. In addition, it can support mass storage devices of up to 8.4 gigabytes, whereas the old standard was limited to 528 MB. Because of its lower cost, enhanced EIDE has replaced SCSI in many areas. There are four EIDE modes defined. The most common is Mode 4, which supports transfer rates of 16.6 MBps. There is also a new mode, called ATA-3 or Ultra ATA, that supports transfer rates of 33 MBps.

EISA *(Extended Industry Standard Architecture)*
EISA is a standard bus (computer interconnection) architecture that extends the ISA standard to a 32-bit interface. It was developed in part as an open alternative to the proprietary Micro Channel Architecture (MCA) that IBM introduced in its PS/2 computers. EISA data transfer can reach a peak of 33 megabytes per second.

ESCD *(Extended System Configuration Data)*
It is a format for storing information about Plug-and-Play (PnP) devices in the BIOS. Windows and the BIOS access the ESCD area each time you re-boot your computer

External Cache
Short for Level 2 cache, cache memory that is external to the microprocessor. In general, L2 cache memory, also called the secondary cache, resides on a separate chip from the microprocessor chip. Although, more and more microprocessors are including L2 caches into their architectures.

IDE *(Integrated Drive Electronics)*
A type of disk-drive interface widely used to connect hard disks, CD-ROMs and tape drives to a PC, in which the controller electronics is integrated into the drive itself, eliminating the need for a separate adapter card. The IDE interface is known as the ATA (AT Attachment) specification.

IEEE 1394
A new, high speed external bus standard, also known as ***FireWire*** or ***iLink***, which supports data transfer rates of up to 400 Mbps for connecting up to 63 external devices.

Internal Cache
Short for Level 1 cache, a memory cache built into the microprocessor. The L1 cache is also called the primary cache.

IrDA *(Infrared Data Association)*
A group of device vendors, including computer, component and telecommunications, who have developed a standard for transmitting data via infrared light waves. This enables you to transfer data from one device to another without any cables.

IRQ *(Interrupt Request Line)*
IRQs are hardware lines over which devices can send interrupt signals to the microprocessor. When you add a new device to a PC, you sometimes need to set its IRQ number by setting a DIP switch. This specifies which interrupt line the device may use. IRQ conflicts used to be a common problem when adding expansion boards, but the Plug-and-Play specification has removed this headache in most cases.

ISA *(Industry Standard Architecture)*
ISA is a standard bus (computer interconnection) architecture that is associated with the IBM AT motherboard. It allows 16 bits at a time to flow between the motherboard circuitry and an expansion slot card and its associated device(s). Also see EISA and MCA.

LAN *(Local Area Network)*
A computer network that covers a relatively smaller area, such as in a building or an enterprise. It is made up of servers, workstations, shared resources, a network operating system and a communications link. These individual PCs and devices on a LAN are known as “nodes”, and are connected by cables to access data and devices anywhere on the LAN, so that many users can share expensive devices and data.

LBA *(Logical Block Addressing)*
Logical block addressing is a technique that allows a computer to address a hard disk larger than 528 megabytes. A logical block address is a 28-bit value that maps to a specific cylinder-head-sector address on the disk. 28 bits allows sufficient variation to specify addresses on a hard disk up to 8.4 gigabytes in data storage capacity. Logical block addressing is one of the defining features of Enhanced IDE (EIDE), a hard disk interface to the computer bus or data paths.

LED *(Light Emitting Diode)*
A semiconductor device that converts electrical energy into light. Since it lights up (usually red) when electricity is passed through it, it is usually used for the activity lights on computer's component, such as disk drivers.

LPT *(Line Printer Terminal)*
Logical device name for a line printer; a name reserved by the MS-DOS for up to three parallel printer ports: LPT1, LPT2, and LPT3. It is frequently used by the OS to identify a printer.

Overclocking
Overclocking is resetting your computer so that the microprocessor runs faster than the manufacturer-specified speed (for example, setting an Intel 166 MHz (megahertz) microprocessor to run at 200 Mhz).

PCI *(Peripheral Component Interconnect)*
A local bus standard developed by Intel that first appeared on PCs in late 1993. PCI provides "plug and play" capability and allows IRQs to be shared. The PCI controller can exchange data with the system's CPU either 32 bits or 64 bits at a time.

PnP *(Plug and Play)*
A set of specifications that allows a PC to configure itself automatically to work with peripherals. The user can "plug" in a peripheral device and "play" it without configuring the system manually. To implement this useful feature, both the BIOS that supports PnP and a PnP expansion card are required.

POST *(Power On Self Test)*
During booting up your system, the BIOS executes a series of diagnostic tests, include checking the RAM, the keyboard, the disk drives, etc., to see if they are properly connected and operating.

PS/2 Port
A type of port developed by IBM for connecting a mouse or keyboard to a PC. The PS/2 port supports a mini DIN plug containing just 6 pins. Most modern PCs equipped with PS/2 ports so that the special port can be used by another device, such as a modem.

RAID
RAID (Redundant Array of Independent Disks; originally Redundant Array of Inexpensive Disks) is a way of storing the same data in different places (thus, redundantly) on multiple hard disks. By placing data on multiple disks, I/O operations can overlap in a balanced way, improving performance. Since multiple disks increases the mean time between failure (MTBF), storing data redundantly also increases fault-tolerance.

SCSI
Acronym for Small Computer System Interface. Pronounced "scuzzy," SCSI is a parallel interface standard used by Apple Macintosh computers, PCs, and many UNIX systems for attaching peripheral devices to computers. SCSI interfaces provide for faster data transmission rates (up to 80 megabytes per second) than standard serial and parallel ports. In addition, you can attach many devices to a single SCSI port, so that SCSI is really an I/O bus rather than simply an interface.

USB *(Universal Serial Bus)*
A hardware interface for low-speed peripherals such as the keyboard, mouse, joystick, etc. USB provides a maximum bandwidth of 12 Mbit/sec (Mbps) for connecting up to 127 peripheral devices to PC. USB features hot swap capability and multiple data streams, allows external devices to be plugged in and unplugged without turning the system off.

Virus
A program or a piece of code that infects computer files by inserting in those files copies of itself. The virus code is buried within an existing program, and is activated when that program is executed. All the viruses are man-made, and often have damaging side effects.

WLAN
Acronym for wireless local-area network. Also referred to as LAWN. A type of local-area network that uses high-frequency radio waves rather than wires to communicate between nodes.